Comprehensive Portal for Indian Shipbuilding and Repair Industry

Detailed Project Report

June 2025

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1. Executive summary

1. Executive summary

1.1 Introduction

The Comprehensive Shipbuilding & Ship Repair Portal is a strategic initiative led by the Directorate General of Shipping (DGS) under the Ministry of Ports, Shipping & Waterways (MoPSW), Government of India. The project aims to digitally transform the Indian shipbuilding and ship repair industry, improving visibility, collaboration, and overall efficiency. By bringing together shipyards, ancillary industries, regulators, financial institutions, design agencies, investors and other industry stakeholders onto a unified digital platform, the portal will drive data-driven decision-making, promote industry collaboration, and enhance India's global competitiveness in the maritime sector.

The Project Strategy Document outlines the roadmap, execution framework, and governance mechanisms required to develop and implement the portal successfully. It details functional requirements, stakeholder engagement, data collection, financial planning, and long-term sustainability measures, ensuring that the initiative aligns with the broader goals of Maritime India Vision (MIV) 2030 and Maritime Amrit Kaal Vision (MAKV) 2047.

1.2 Objectives of the Portal

The portal is designed to:

- Enhance industry visibility – Provide a comprehensive digital repository of Indian shipbuilding and repair capabilities including the allied sectors, enhancing the industry competitiveness and global positioning.
- Capability showcase - Provide real-time industry intelligence and performance insights through dashboards, analytics, and dynamic capability assessment frameworks
- Facilitate stakeholder collaboration – Establish a centralized digital platform to connect all key stakeholders of the Indian shipbuilding and repair ecosystem.
- Promote financial & investment opportunities – Offer structured information on financial assistance schemes, government incentives, and investment opportunities to catalyze sectoral growth.
- Support workforce development – Enable access to available training and certification programs for shipbuilding industry professionals.

- Encourage innovation, sustainability & R&D – Encourage innovation, sustainability, and adoption of green technologies through collaboration and information sharing.
- Ensure regulatory compliance – Provide centralized access to maritime regulations, classification standards, and policy updates.

These objectives are closely aligned with the Maritime India Vision (MIV) 2030 and the Maritime Amrit Kaal Vision (MAKV) 2047, both of which emphasize the modernization, self-reliance, and global competitiveness of India's maritime sector. The portal directly supports MIV 2030's goals of digital transformation, port-led industrialization, and increased shipbuilding capacity by acting as a technology-driven enabler that improves sectoral visibility, enhances ease of doing business, and promotes investor confidence. Furthermore, in line with MAKV 2047's long-term vision of establishing India as a leading global maritime hub, the portal facilitates integrated development across the shipbuilding, ship repair, and ship recycling value chain. It provides tools to improve workforce skill development, attract green investments, and drive innovation in sustainable maritime technologies—key pillars of MAKV 2047's strategic direction.

1.3 Key features of the Portal

The portal will be structured into multiple functional modules, each designed to address specific industry needs:

- Capability Insights module – Showcases shipyard profiles, past projects, and capability assessment framework.
- Collaboration Hub module – Provides a discussion platform for industry networking, project-based collaboration, and expert Q&A forums.
- Training & Certification module – Lists training programs and certification courses for skill development.
- Finance & Insurance module – Features information on government financial schemes, financing options, and investment incentives.
- Innovation Centre module – Facilitates R&D collaborations, technology adoption, and sustainability initiatives.
- Technical Library module – Serves as a knowledge repository for technical documents, design specifications, and industry guidelines.
- Regulatory & Compliance module – Offers structured information on regulatory frameworks and classification requirements.

- Industry Directory module – Provides a comprehensive database of stakeholders in the Indian shipbuilding and repair industry.

1.4 Project execution strategy

The development of the portal will be undertaken in a phased manner, ensuring structured implementation, continuous validation, and minimal risks.

Phase 1: Requirement gathering & stakeholder engagement

- Identify key stakeholders, including shipyards, regulators, design agencies, financial institutions, skill development centers and others.
- Collect industry data through standardized questionnaires and on-ground surveys (supported by IRS personnel).
- Analyze global scenario from regulatory and policy point of view in leading shipbuilding nations (China, South Korea, Japan) to incorporate insights.

Phase 2: Functional specifications & module design

- Define module-wise functionalities and develop the preliminary functional requirements.
- Validate requirements with DG Shipping and select major industry stakeholders to ensure alignment with operational needs.

Phase 3: DPR & System Integrator (SI) onboarding

- Prepare a Detailed Project Report (DPR) for the Portal development.
- Prepare a detailed Request for Proposal (RFP), outlining functional specifications, evaluation criteria, and implementation milestones.
- Conduct a transparent vendor selection process to onboard a System Integrator (SI) responsible for Software Requirements Specifications (SRS) and portal development.
- Finalize SLAs and contractual agreements to ensure compliance with project timelines and quality standards.

Phase 4: Portal development and deployment

- Adopt an Agile Development Model, ensuring modular development and continuous validation.
- Develop core functionalities, integrate data security measures, and establish API linkages with external portals (as required).
- Conduct rigorous testing (UAT, security, and performance testing) before the final launch.

Phase 5: Post-implementation & continuous improvement

- Ensure ongoing portal maintenance and technical support through a dedicated team.
- Employ dedicated manpower or retain IRS-deployed resources for content moderation, quality control, and data verification.
- Establish mechanisms for continuous feedback, user training, and system upgrades.

1.5 Implementation strategy & SI rollout plan

The portal's implementation will follow a structured, seven-phase strategy led by a qualified System Integrator (SI). The SI will be onboarded through a transparent RFP process and will be responsible for end-to-end development, deployment, and post-launch support of the platform. Key phases include:

- Requirement gathering – Stakeholder consultations and system scoping.
- Planning & UI/UX design – Wireframing, user journey mapping, and module planning.
- Prototype development – Early-stage validation of core functionalities.
- Full portal development – Agile development with modular rollouts.
- Testing & quality assurance – UAT, security, and performance testing.
- Deployment & launch – Staggered go-live with performance monitoring.
- Post-implementation support – Continuous updates, user training, and technical support.

This phased approach ensures timely delivery, operational alignment, and long-term sustainability of the portal, in close coordination with the Project Monitoring and Control Committee (PMCC).

1.6 Monitoring & evaluation framework

A structured Project Monitoring & Control Committee (PMCC) mechanism will be in place to:

- Track project performance through defined KPIs and milestone-based reviews.
- Facilitate collaboration between DG Shipping, SI, and industry stakeholders.
- Implement a continuous improvement framework for optimizing portal functionalities.

1.7 Long-term sustainability & way ahead

To ensure the long-term viability and success of the portal, the following measures will be adopted:

- Strategic governance model to maintain data integrity, industry engagement, and system security.

- Regular content updates to reflect policy changes, regulatory updates, and industry developments.
- Scalability provisions for incorporating advanced analytics, AI-driven insights, and predictive modeling.
- Integration with global shipbuilding databases and IMO-aligned sustainability initiatives to enhance India’s presence in the international maritime sector.

2. Maritime landscape in India

2. Maritime landscape in India

India boasts a coastline of approximately 7,500 km, which includes 12 major ports and over 200 minor ports. Positioned along some of the world's busiest shipping routes, India is a crucial hub for international trade. The majority of cargo ships traveling between East Asia and destinations like America, Europe, and Africa pass through Indian waters.

The maritime sector is vital to India's economy, handling around 95% of the country's trade by volume and 70% by value. In 2024, India processed 819 million tonnes of cargo, underscoring its role as a key trading nation. The sector also supports a fleet of 1,530 ships sailing under the Indian flag, highlighting its growing presence in global shipping.[1]

India has two ports in the global top 30, with a total port capacity of approximately 2,700 MTPA. This indicates that while India has a substantial port infrastructure, there is significant room for expansion and modernization to compete with global leaders. (As per MAKV 2047).

India's container vessel turnaround time is highly competitive, averaging less than one day at Jawaharlal Nehru Port, Navi Mumbai[2]. This is better than the USA's 1.5 days and on par with Singapore's 1.0 day. Such efficiency is crucial for reducing logistics costs and improving trade competitiveness.

India also ranks fifth globally in terms of the number of seafarers deployed, with a total of more than 285,000 seafarers[3] contributing 15% to the global maritime workforce in 2023. China and the Philippines hold the first and second positions, respectively. While the third and fourth positions were held by Russia and Ukraine, respectively[4]. This highlights India's significant role in the global maritime labour market.

India ranks 38thnd in the World Bank's Logistics Performance Index[5] for international shipments. Singapore and Finland hold the top two positions, while China is ranked 19th. This ranking indicates a need for improvements in India's logistics infrastructure and efficiency to climb higher in global standings.

India's shipbuilding industry ranks 22nd globally, with an annual output of 100,000 gross tonnage, representing less than 1% of the global market share. This suggests potential for growth

[1] Press Information Bureau - Sagarmanthan 2024: India's Maritime Vision, dated 19 Nov 24
[2] Press Information Bureau - Average turnaround time of Major Ports, dated 3 Dec 24
[3] DGS Circular No. 06 of 2024 dated 14 Mar 24
[4] Review of Maritime Transport 2021, United Nations Conference on Trade and Development
[5] 2023 | Logistics Performance Index (LPI)

and development in this sector, which could enhance India's position in the global shipbuilding market. (As per MAKV).

India's inland waterways and coastal shipping handle a combined total of 295 million tonnes of cargo, with a modal share of around 6%. This is lower compared to countries like the USA (11%), UK (12%), Korea (15%), and Spain (16%). Increasing the utilization of these modes of transport could significantly enhance India's cargo handling capacity.

India is set to assume leadership roles in several key maritime forums in 2025, including the Indian Ocean Rim Association (IORA) and the Indian Ocean Naval Symposium (IONS). These platforms will enable India to shape maritime norms and enhance regional cooperation on issues such as piracy, climate change, and maritime security. India will also host the Quad leaders' summit in 2025, further cementing its role in the Indo-Pacific[6].

India is actively pursuing green and smart port initiatives to enhance the efficiency and sustainability of its maritime infrastructure. The "Sagarmanthan: The Great Oceans Dialogue" held in 2024, focused on themes such as the blue economy, global supply chains, maritime logistics, and sustainable growth. This event highlighted India's commitment to fostering a vibrant and future-ready maritime ecosystem.

While India's maritime sector presents significant opportunities, it also faces challenges such as piracy, climate change, and the need for sustainable practices. By leveraging its strategic position and fostering international cooperation, India aims to address these challenges and strengthen its maritime landscape.

India's maritime landscape is poised for significant growth and transformation, driven by strategic initiatives, international cooperation, and a commitment to sustainability. This dynamic sector will continue to play a crucial role in India's economic and security framework.

2.1 Shipping industry

2.1.1 Overview of the shipping industry

The shipping industry in India is a vital component of the nation's trade and commerce, with approximately 95% of India's trading by volume and 70% by value conducted through maritime transport. This sector is crucial for the economic growth and development of the country, providing a cost-effective and efficient means of transporting goods.

[6] Observer Research Foundation - Why 2025 could be India's maritime moment, 26 Dec 24

The industry is supported by a robust infrastructure, including 12 major ports and over 200 notified non-major ports. The country's coastline stretches for 7,516.6 km, making it the sixteenth-largest maritime nation globally. The industry has seen significant growth over the years, driven by high external trade and government initiatives aimed at modernizing and expanding port infrastructure.

2.1.2 Indian ports

India's key major ports include Kandla, Mumbai, Jawaharlal Nehru (Nhava Sheva), Mormugao, New Mangalore, Cochin, Chennai, Ennore, Tuticorin, Visakhapatnam, Paradip, and Kolkata (including Haldia). These ports handle a significant portion of the country's cargo traffic, contributing to the overall efficiency and capacity of the maritime sector. In FY24, ports in India handled 817.97 million tonnes of cargo traffic, marking a 4.45% increase from 784.305 million tonnes in FY23 as per MoPSW data[7].

2.1.3 Indian fleet[8]

India has a fleet strength of 1526 vessels with 13.75 million gross tonnages (GT) in 2023 as compared to fleet strength of 1520 vessels with 13.69 million GT in 2022. During last one year, 6 vessels has been added to the fleet with an increase of 0.06 million GT.

Out of the 1526 vessels registered as on 31st December 2023, 68% vessels were engaged in coastal trade and the remaining 32% vessels were engaged for overseas trade. In terms of cargo volume, 88% of Indian GT was engaged in the overseas trade as compared to only 12% engagement of Indian GT in coastal trade. The trend of Indian Shipping Fleet (Overseas & Coastal Trade) during last three years is shown in Figure 1.

[7] MOPSW report on cargo handling status for Major Ports MARCH 2024
[8] Indian Shipping Statistics Report 2023

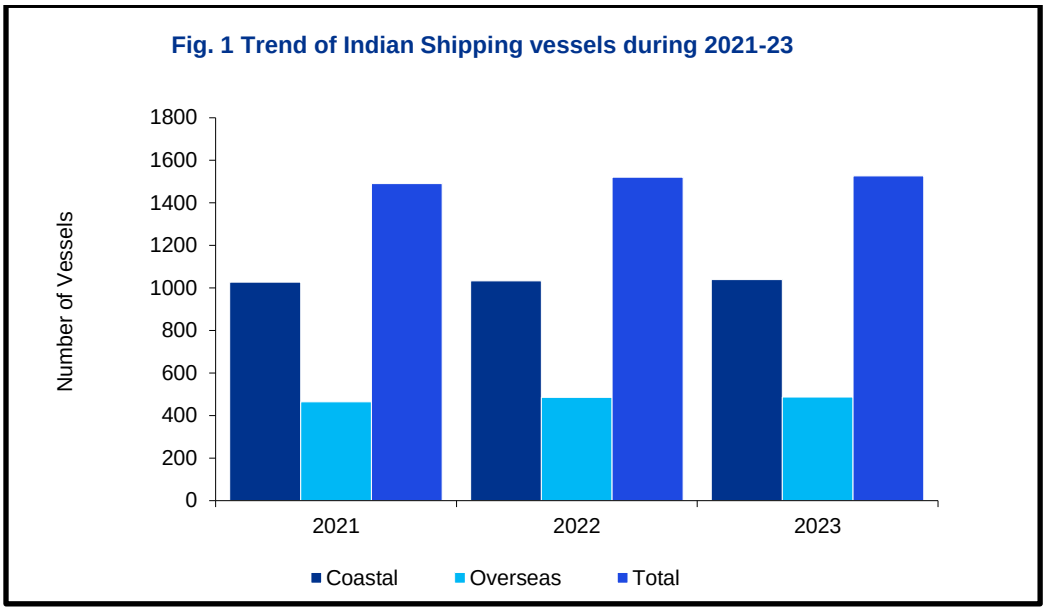


Figure 1 Trend of Indian shipping vessels during 2021-23

Fleet Composition: Fleet classification analysis by the type of vessels in 2023 shows that the maximum numbers of vessels (900) were Dry Cargo Liner vessels followed by oil tankers (197). In terms of GT, the maximum 55.8% tonnage (7.67 million GT) was in the category of Oil Tankers whereas, Dry Cargo Liner vessels (which accounted for highest number of vessels) contributed only 24.5% (3.37 million GT) to India's total tonnage The change in the composition of Indian fleet in terms of type of vessels in the last decade (2013 and 2023) is given in Figure 2 and 3 respectively. (Source: ISS Report 2023)

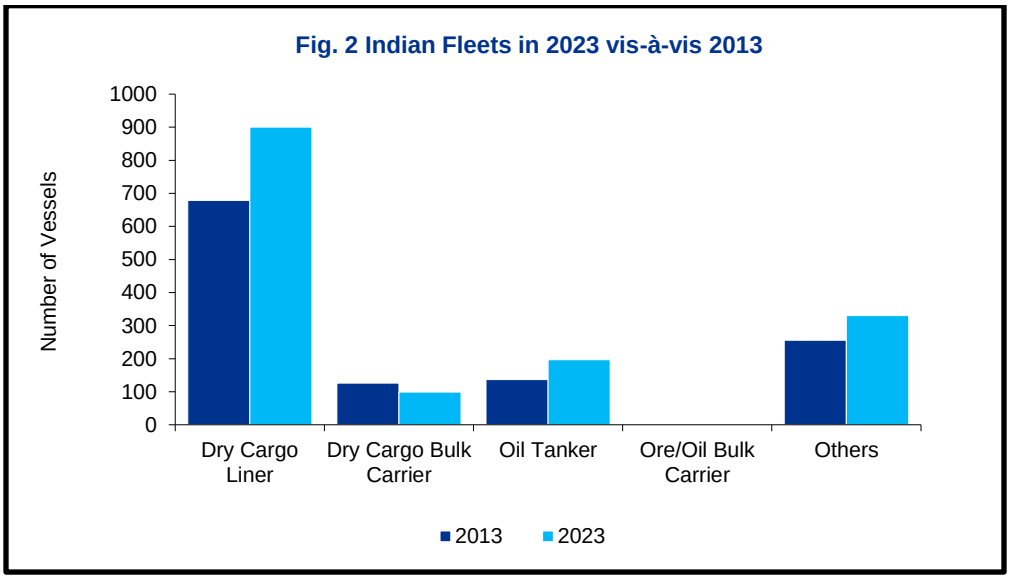


Figure 2 Indian fleet in 2023 vis-à-vis 2013

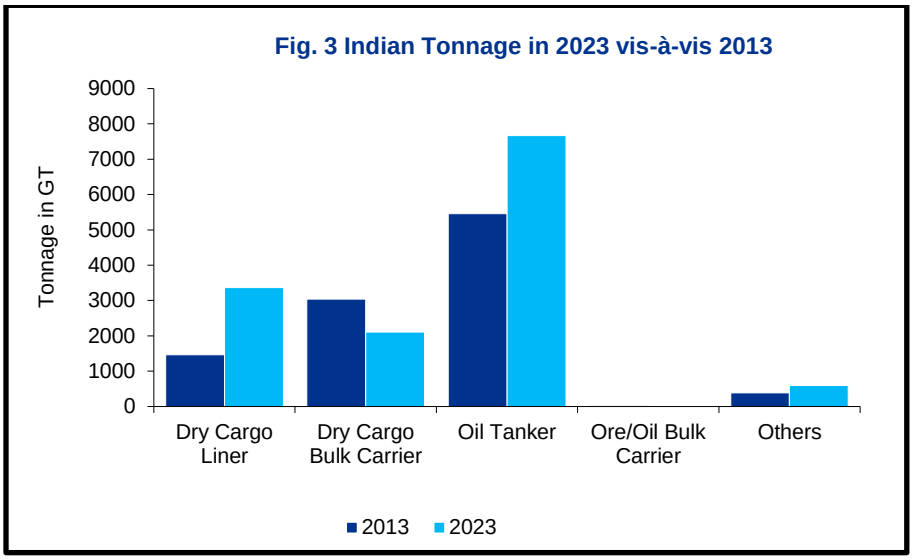


Figure 3 Indian tonnage in 2023 vis-à-vis 2013

The composition of India's tonnage reveals that tonnage share of oil tanker has increased from 52.6% in 2013 to 55.8 % in 2023. Also, the tonnage share of dry cargo bulk carriers has decreased from 29.3 % in 2013 to 15.3% in 2023. Similarly, over the same period, the tonnage share of dry cargo liner has increased from 14.1% to 24.5%.

The age profile of Indian merchant shipping vessels shows 45.5% of the fleet was above 20 years old, 15.7 % of the fleet was between 16-20 years, 20.8 % of the fleet was between 11-15 years, 10.3 % of the fleet was between 6-10 years while 7.7% of the fleet was in the age group of 0-5 years in year 2023.

2.1.4 Overseas trade[9]

As on 31st December 2023, 487 Indian registered vessels of 12.02 million GT were deployed on overseas trade. Among the 487 vessels for overseas trade, the maximum number of vessels (184) was of the age group "over 20 years" with GT of 4.02 million.

The maximum number of overseas vessels (127) was in the size range of 1000 and 4999 GT. The total GT of these 127 vessels was 0.30 million. About 42.9% of the vessels (209) undertaking overseas trade were in the category of Dry Cargo Liner whose carrying capacity was 2.52 million GT. It has been observed that there were 105 companies with single ship deployed on overseas route with a total GT of 1.27 million.

[9] Indian Shipping Statistics Report 2023

In Overseas trade, the Shipping Corporation of India was the largest Indian shipping company which had 55 vessels comprising of 2.75 million GT followed by Great Eastern Shipping Co Ltd which had 44 vessels with 1.97 million GT.

Table 1 Largest Indian shipping companies in terms of overseas trade

Company Name	Number of Vessels	Gross Tonnage (GT)
Shipping Corporation of India	55	2.75 million
Great Eastern Shipping Co Ltd	44	1.97 million
Seven Island Shipping Ltd	25	0.81 million
Mercator Limited	16	0.60 million

The modal age of Coastal vessels (510) was above 20 years representing 0.87 million GT. Distribution of vessels by size class depicts that 714 vessels were in the size class “Below 999” GT. Ocean Sparkle Ltd. owned maximum (65) vessels with 0.03 million GT (1.7 % of the total coastal tonnage) followed by Reliance Industries Limited which owned 27 vessels with 0.018 million GT (1.0% of the total coastal tonnage). There are 256 companies with single ship deployed on coastal routes representing a total of 0.46 million GT.

2.1.5 Coastal trade[10]

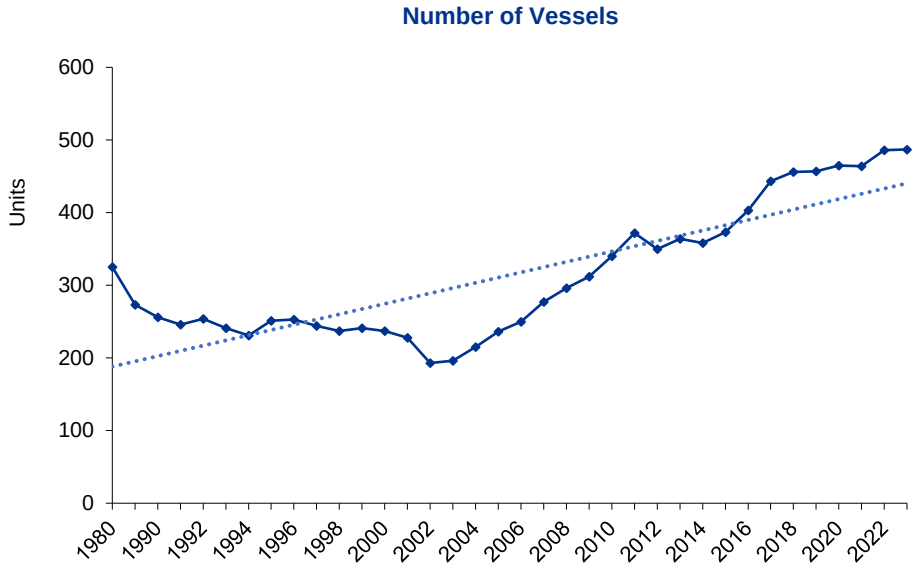
Out of the 1526 vessels as on 31st December 2023, 1039 vessels were engaged in coastal trade with 1.72 million GT. Out of these 1039 vessels the maximum number of vessels (378) were registered under the category “Tug” with 0.15 million GT. However, only one vessel each was registered in the categories “Cellular Container”, “Dumb Crane Barge”, “Motor Tug”, “Passenger High Speed Craft”, “Pilot Vessel”, “RO-RO Container Vessel”, “Utility Boat”, “Work Boat” & “Yacht” with less than 1000 GT.

2.1.6 Trend of shipping sector in India[11]

During Independence, in August 1947, the Indian Shipping tonnage was at 0.19 million GT, consisting of 48 coastal ships with 0.12 million GT and 11 overseas vessels with 0.07 million GT. Since then, the Indian Shipping tonnage has registered a remarkable growth. During 1990s,

[10] Indian Shipping Statistics Report 2023
[11] Indian Shipping Statistics Report 2023

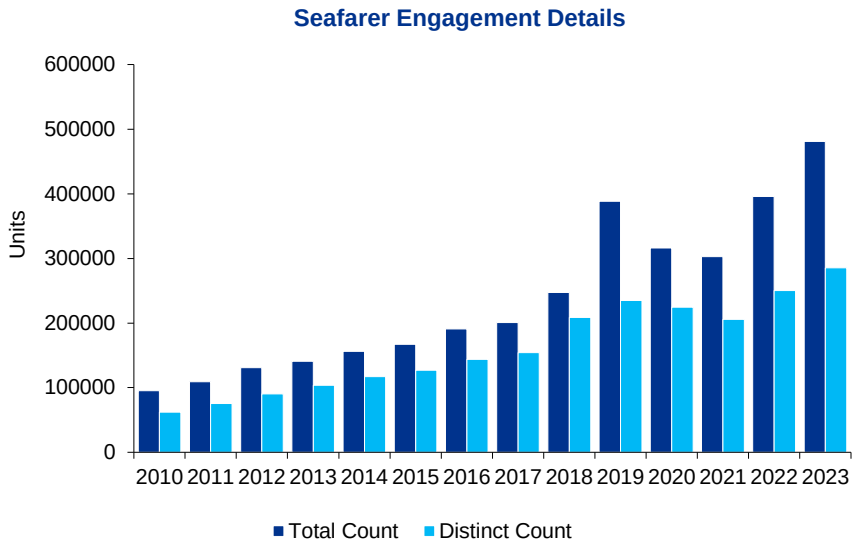
Indian Shipping tonnage was 5.68 million GT with 383 vessels as on 31st December 1980 had increased to 6.95 million GT with 549 vessels as on 31st December 2000 and to 10.17 million GT with 1040 vessels as on 31st December 2010. The Indian merchant fleet strength stood at 1526 vessels with 13.75 million GT as on 31st December 2023. This represents 72-fold increases in GT since independence. The outlay and expenditure on shipping sector has consistently increased over the plan.



2.1.7 Manning[12]

Manning is a critical aspect of the shipping industry, involving the recruitment, training, and management of seafarers. India is one of the largest suppliers of seafarers globally, with over 200,000 Indian seafarers employed on various types of vessels. The country has a well-established system for training and certifying seafarers, ensuring they meet international standards. Seafarers' wages and employment terms vary based on the type of vessel and rank, with officers typically earning higher wages than ratings. The demand for skilled seafarers is expected to grow in line with the expansion of the Indian fleet and global shipping industry. Following is the five-yearly snapshot of Indian seafarer's manning scenario since year 2010 till 2023 (latest data available):

[12] DGS Circular No. 06 of 2024 dated 14 Mar 24



a. 2010: Laying the foundation

In 2010, the Indian maritime sector was steadily growing, with 62,267 distinct counts of Indian seafarers engaged on both foreign and Indian-flagged vessels. The majority of employment came from foreign-flagged ships, signalling India's growing contribution to the global maritime workforce.

Table 2 Seafarer engagement in 2010

Category	Total Count
Total Seafarers (Distinct)	62,267
Officers	35,556
Ratings	26,711

Foreign-flagged vessels provided majority of employment, while coastal trade under Indian-flagged ships remained relatively small.

b. 2015: Stronger presence in global and coastal trade

By 2015, the number of Indian seafarers saw a significant rise to 167,181, fuelled by increasing employment opportunities on both foreign- and Indian-flagged ships. The distinct count of employed seafarers reached 126,945, showing that more individuals were entering the industry.

Table 3 Seafarer engagement in 2016

Category	Total Count	Indian-Flagged Ships	Foreign-Flagged Ships
Total Seafarers	143,940	20,211	123,729
Officers	68,576	10,163	57,910
Ratings	75,364	10,048	65,819

- Foreign trade accounted for 85.9% of total employment.
- Coastal trade under Indian-flagged ships grew, employing nearly 14.1% of total Indian seafarers. (This data segregating seafarers on Indian-Flagged and Foreign-Flagged ships has been available since year 2016)

c. 2020: Navigating the pandemic's challenges

Despite global disruptions due to COVID-19, the number of Indian seafarers reached 316,010 in 2020, with distinct count being 224,478 making India one of the top providers of maritime manpower worldwide.

Table 4 Seafarer engagement in 2020

Category	Total Count	Indian-Flagged Ships	Foreign-Flagged Ships
Total Seafarers	224,478	32,763	191,715
Officers	88,256	13,891	74,365
Ratings	136,226	18,872	117,350

- Foreign-flagged ships still dominated, accounting for 85.4% of total employment.
- Coastal trade saw a slight increase, with 14.6% of Indian seafarers engaged in Indian-flagged vessels.
- The pandemic caused temporary job fluctuations, but the resilience of Indian seafarers helped maintain workforce stability.

d. 2023: A historic milestone in global maritime trade

By 2023, Indian seafarers reached an all-time high, with total 481,045 and 285,454 distinct count engaged on ships worldwide. The steady rise in Indian seafarers employed in foreign trade reflects India's global maritime leadership.

Table 5 Seafarer engagement in 2023

Category	Total Count	Indian-Flagged Ships	Foreign-Flagged Ships
Total Seafarers	285,454	28,327	257,127
Officers	50,031	12,176	93,450
Ratings	141,898	16,151	163,677

- Foreign trade dominance continued, employing 90.0% of all Indian seafarers.
- Coastal trade engagement remained steady, with 10.0% of Indian seafarers working on Indian-flagged ships.
- Female representation also increased, reaching 4,770 women seafarers, marking significant progress in gender diversity.

2.1.8 Key takeaways: Growth and future outlook

- Rapid Growth: Indian seafarers' distinct count grew fivefold from 62,267 in 2010 to 285,454 in 2023.
- Foreign Trade Dominance: Employment on foreign-flagged ships consistently remained above 80%, peaking at 90.0% in 2023.
- Steady Coastal Trade Growth: The number of Indian seafarers on Indian-flagged vessels increased, showing opportunities in coastal shipping and domestic trade.
- Gender Inclusion: The participation of female seafarers saw a sharp rise, reflecting positive policy changes.

2.2 Shipbuilding and ship repair industry

The shipbuilding and repair industry in India has experienced remarkable growth and transformation over the past few years. Despite its relatively small share of the global market, accounting for less than one percent, the industry is poised for substantial expansion due to several key factors which are discussed further in detail.

India's shipbuilding sector is supported by a robust infrastructure comprising major shipyards such as Cochin Shipyard Limited, Mazagon Dock Shipbuilders Limited, and Garden Reach Shipbuilders & Engineers Limited. These shipyards are involved in constructing a diverse range of vessels, including commercial ships, defence vessels, and offshore platforms. Cochin Shipyard, for instance, is renowned for building large vessels and has recently ventured into constructing aircraft carriers for the Indian Navy. Mazagon Dock, on the other hand, specializes in submarines and warships, contributing significantly to India's defence capabilities.

The Indian government has played a crucial role in promoting the shipbuilding and repair industry through various initiatives and policies. The 'Make in India' campaign, launched in 2014, aims to boost domestic manufacturing, including shipbuilding. The government has also introduced financial incentives such as subsidies and tax benefits to encourage investment in this sector. Additionally, the Shipbuilding Financial Assistance Policy provides financial support to Indian shipyards for the construction of vessels, further enhancing their competitiveness on the global stage.

India's strategic location along major international shipping routes is another significant advantage for the shipbuilding and repair industry. The country's extensive coastline of over 7,500 km and its proximity to key maritime trade routes make it an ideal hub for shipbuilding and repair activities. This geographical advantage not only facilitates the construction and maintenance of vessels but also attracts international clients seeking efficient and cost-effective services.

The demand for maritime transport is on the rise, driven by the growth of global trade and the need for modern, efficient vessels. This trend has created a favourable environment for the Indian shipbuilding industry, which is increasingly focusing on innovation and technological advancements. Indian shipyards are adopting state-of-the-art technologies and practices to enhance their production capabilities and meet international standards. For example, the use of advanced materials and automation in shipbuilding processes has improved the efficiency and quality of vessel construction.

Moreover, the ship repair segment is gaining traction, with several shipyards expanding their repair and maintenance facilities. The growing fleet of aging vessels requires regular maintenance and repairs, providing a steady stream of business for Indian shipyards. The government's emphasis on developing port infrastructure and enhancing maritime connectivity further supports the growth of the ship repair industry.

Shipbuilding is a technology-driven, skill-intensive, and material-intensive assembly operation. As a labour-intensive industry, labour costs play a crucial role in determining a country's competitive position. Over the years, the industry has shifted from Europe to Japan, then to South Korea, and has now firmly established itself in China.

The factors driving this shift include relatively high wages in Europe, coupled with the strong competitive strength of manufacturing and steel-making sectors, and active state support in the leading shipbuilding nations of East and Far East Asia. This significant shift in shipbuilding activities from Europe to Asia has created opportunities for Indian shipyards in both the public and private sectors. According to the latest data from Clarksons Research, the global shipbuilding industry saw significant activity in 2024. China, South Korea, and Japan continue to dominate the market. In 2024, China accounted for approximately 53% of the global market share by compensated gross tonnage (CGT), South Korea held 28%, and Japan had 12%. This data highlights China's consolidation of its lead position, taking over two-thirds of all contracts by tonnage.

Shipbuilding is a manufacturing industry characterized by nearly 65% value addition from other technology and ancillary industries such as steel, electronics, engineering, and port infrastructure. As an order-driven industry where each vessel is custom-built, building a robust order book is essential for the growth and sustainability of the shipbuilding industry.

India has demonstrated strong shipbuilding capabilities in the past, with several shipyards delivering high-quality vessels globally. However, Indian shipyards are lately struggling against global downturns and competition, which has resulted into less than 1% throughput for Indian shipyards at global level. To revitalize and enhance Indian shipbuilding and ship repair capacities and capabilities, the Indian Government has initiated several policy measures detailed in later sections.

As a core sector with one of the highest job multipliers (6.48x), the shipbuilding industry has generated approximately 1.8 to 2 lakh jobs (direct and indirect) in recent years. One of the primary challenges in Indian shipbuilding is the high-cost disadvantage compared to global

competitors. It is crucial for India to achieve around 25% to 30% cost competitiveness by increasing automation levels and reducing material and financing costs.[13]

The future of shipbuilding is expected to be driven by green technology, autonomous vessels, and cost-efficient technologies. India has significant opportunities to build scale in the short sea vessel segment. MIV 2030 envisions the Indian shipbuilding industry rebuilding its threshold scale by 2025 and initiating a 'Virtuous Cycle' to enable "Make in India, Make for World."

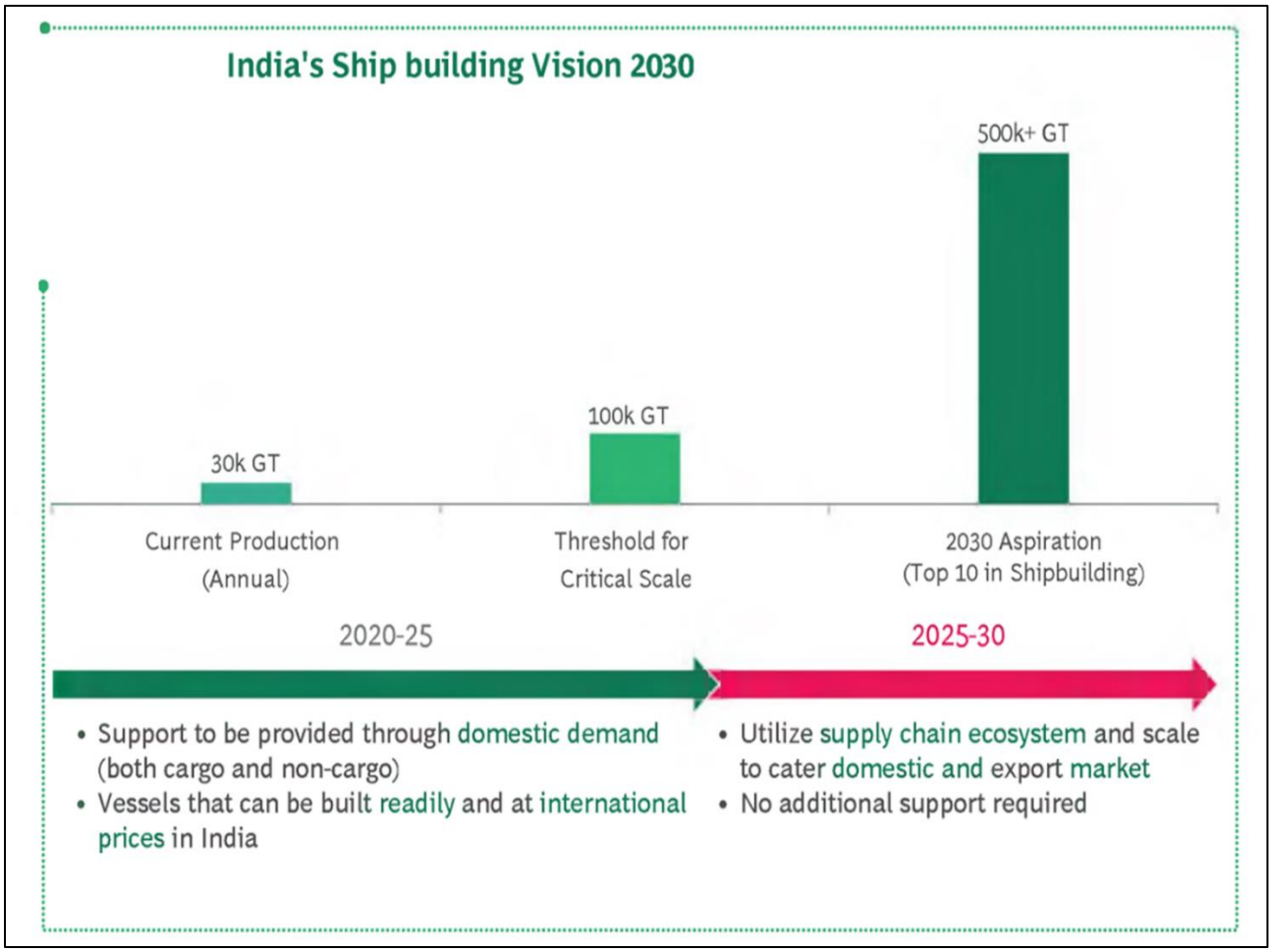

India's Ship building Vision 2030
500k+ GT
100k GT
30k GT
Current Production (Annual)
Threshold for Critical Scale
2030 Aspiration (Top 10 in Shipbuilding)
2020-25
2025-30
• Support to be provided through domestic demand (both cargo and non-cargo)
• Vessels that can be built readily and at international prices in India
• Utilize supply chain ecosystem and scale to cater domestic and export market
• No additional support required

Figure 4 India's Shipbuilding Vision 2030

[13] KPMG Report - Leveraging defence ship building to catalyse India's shipbuilding industry, Nov 2020

2.2.1 Capabilities[14]

The Indian shipbuilding and repair industry has shown significant growth and potential, driven by its strategic geographic location, extensive coastline, and burgeoning domestic market. Here are some key insights into its capabilities:

a. Current capabilities

Shipyards: Presently, India has 4,63,800 DWT ship-building capacity in public sector and 11,86,500 DWT capacity under private sector[15]. Following table enlists the existing shipbuilding capacity in India. These shipyards are spread across the country, with major ones located in Mumbai, Goa, Kochi, and Visakhapatnam. The combined list of Indian shipyards under public and private sectors is as follows:

Table 6 Ship-building capacity of India in public sector[16]

S.No	Name of Shipyard	Ownership	DWT Capacity
1	Goa Shipyard Limited	GoI, MoD	24,000
2	Garden Reach Shipbuilders And Engineers Ltd	GoI, MoD	20,000
3	Hindustan Shipyard Limited	GoI, MoD	80,000
4	Mazagon Dock Shipbuilders Ltd	GoI, MoD	80,000
5	Cochin Shipyard Limited	GoI, MoPSW	235,000
6	Udipi Cochin Shipyard (Previous name: Temba Shipyards Limited)	GoI, MoPSW	9,000
7	Hooghly Cochin Shipyard Limited	GoI, MoPSW	3,000
8	Shalimar Works Ltd	Govt of WB	12,000
9	Kerala Shipping & Inland Navigation Corporation Ltd (KSINC)	Govt of Kerala	800
10	Alcock Ashdown & Co. Ltd	Govt of Gujarat	Under NCLT
11	Swan Defence and Heavy Industries Ltd.	Private	900,000
12	Shoft Shipyard Private Limited	Private	36,000
13	Chowgule Sbd Private Limited	Private	32,000
14	L &T Shipbuilding Limited	Private	26,000
15	Praka Engineering shipyard	Private	20,000
16	Dempo Shipbuilding and Engineering Private Limited	Private	18,000

[14] Defence Research and Studies - Future of India's Shipbuilding Industry: Challenges and Opportunities dated 24 Oct 2024

[15] Source: DG Shipping provided dataset on shipyards

[16] Source: DG Shipping provided dataset on shipyards

S.No	Name of Shipyard	Ownership	DWT Capacity
17	Vijai Marine Services	Private	12,000
18	Mandovi Drydocks	Private	12,000
19	Waterways Shipyard Pvt Ltd	Private	10,000
20	Synergy Shipbuilders	Private	10,000
21	Zuari Shipyard Private Limited	Private	9,000
22	San Marine Shipyard	Private	8,000
23	Victoria Shipbuilding and Engineerings LLP	Private	8,000
24	Chowgule and Company Pvt. Ltd.	Private	7,000
25	Navgathi Marine Design and Constructions Pvt Ltd	Private	7,000
26	Titagarh Wagons Limited	Private	6,000
27	Atreya Shipyard Private Limited	Private	6,000
28	Modest Infrastructure Pvt. Ltd	Private	6,000
29	Suryadipta Shipyard	Private	6,000
30	Sea Blue Shipyard Ltd	Private	5,000
31	Island Ship Repairers	Private	5,000
32	West Coast Shipyard Ltd	Private	5,000
33	Timblo Drydocks Pvt Ltd	Private	5,000
34	Master Shipyard Pvt Ltd	Private	4,000
35	Konkan Barge Builders Pvt Ltd	Private	3,000
36	MOC Shipyards Private Limited	Private	3,000
37	A C Roy Shipbuilders Private Limited	Private	3,000
38	Essfour Engineering Pvt. Ltd.	Private	3,000
39	Majestic Dockyard Pvt. Ltd	Private	3,000
40	Solas Marine	Private	2,100
41	Aquarius Shipyard Pvt. Ltd.	Private	2,000
42	Sunrich Ship Management Pvt Ltd	Private	2,000
43	Navalt Solar And Electric Boats Pvt Ltd	Private	1,600
44	Marine Frontiers Pvt Ltd Limited	Private	300
45	A H Wadia Boat Builders	Private	300
46	Bristol Boats Pvt, Ltd	Private	200
47	Chidambaram Shipcare Pvt. Ltd	Private	Not Available
48	Homa Engineering works	Private	Not Available
49	Sembmarine Kakinada Limited	Private	Not Available

S.No	Name of Shipyard	Ownership	DWT Capacity
50	Abhishek Engineers Goa	Private	Not Available
51	Jhellingham Engineering Works Pvt Ltd	Private	Not Available
52	Aaditya Shipping and Logistics	Private	Not Available
53	Vipul Shipping & Engineering works	Private	Not Available
54	Marine Care & Associates	Private	Not Available
55	Patra Shipping Pvt. Ltd	Private	Not Available
56	Roshini Ship Repairs and Engineers	Private	Not Available
57	Velocity Ship Builders LLP	Private	Not Available
58	Sierra Shipyard Private Limited	Private	Not Available
59	Sadhav Offshore Engineering Pvt Ltd	Private	Not Available
Total Capacity of Indian shipyards in DWT			**1,650,300**
Total Capacity of Indian shipyards in GT			**990,180**

Defence shipbuilding: The Indian shipbuilding industry has a strong focus on defence, with significant contributions to the Indian Navy and Coast Guard. This includes the construction of advanced warships, submarines, and patrol vessels. The defence sector has been a catalyst for technological advancements and skill development within the industry.

Commercial shipbuilding: Indian shipyards also build various commercial vessels such as barges, tugs, and bulk carriers. However, the commercial segment faces challenges like higher material and labour costs, lower productivity, and higher financing costs compared to global competitors.

Repair and maintenance: The repair and maintenance segment are robust, with facilities capable of handling a wide range of vessels. Indian shipyards offer services such as dry docking, hull repairs, machinery overhauls, and retrofitting.

b. Challenges

High infrastructure costs: Building and maintaining shipyards require substantial capital investment, making the industry capital-intensive and risk prone.

Technological upgradation: Continuous technological upgrades are necessary to stay competitive. Indian shipyards often lag behind global leaders like China, South Korea, and Japan in terms of advanced infrastructure and technology.

Skilled workforce: There is a shortage of skilled labour, which affects productivity and efficiency. Training and development programs are essential to bridge this gap.

c. Opportunities

Strategic location: India's central location in the Indian Ocean Region (IOR) is advantageous for global trade and energy security. This positions India as a crucial player in maintaining the security and stability of sea lanes vital for international trade.

Government initiatives: The Indian government has launched several initiatives to boost the shipbuilding industry, including the 'Make in India' campaign, which encourages domestic manufacturing and self-reliance.

Growing domestic market: With increasing demand for maritime transport and infrastructure development, there is significant potential for growth in the domestic market.

3. Challenges and issues in the Indian shipbuilding and ship repair industry

3. Challenges and issues in the Indian shipbuilding and ship repair industry

3.1 Overview of the challenges faced by the industry

The Indian shipbuilding and ship repair industry faces a multitude of challenges that hinder its growth and competitiveness. One of the primary issues is the high cost and limited availability of critical input materials such as raw materials, manpower, and technology. Indian shipyards are at a significant cost disadvantage compared to their foreign counterparts, with a cost differential of 20%-35%. This is exacerbated by the reliance on imports for most of the inputs consumed in shipbuilding, which puts additional cost pressures on Indian firms. Furthermore, the high financing costs and lack of long-term, low-cost funding options make it difficult for Indian shipyards to compete on a global scale.

Another major challenge is the limited infrastructure and capacity of Indian shipyards. With only 9 public (+1 under NCLT) and 34 major private sector (49 yards including small private yards[17]) shipyards, India lags behind major shipbuilding nations like China and South Korea, which have over 450 and 400 shipyards, respectively. The existing shipyards in India are primarily engaged in building warships for the Indian Navy and Coast Guard, leaving little capacity for commercial shipbuilding. Additionally, the lack of investment in research and development (R&D) and skill development further hampers the industry's ability to innovate and improve productivity.

3.2 Demand from domestic market

Indian shipyards face stiff competition in the domestic market due to the absence of tariff barriers, which allows foreign shipyards to outbid them. This lack of protection against foreign competition makes it challenging for Indian shipyards to secure orders from the Central and State Governments. Despite having the lowest labour costs among competing countries like China, Japan, and South Korea, Indian shipyards are unable to translate this advantage into cost-effectiveness. Factors such as reliance on imported raw materials, higher financing costs, and limited access to advanced technology contribute to this disparity.

The domestic demand for shipbuilding is also affected by the limited number of shipyards and their capacity constraints. Most of the existing shipyards are focused on fulfilling government orders, leaving little room for commercial shipbuilding. This has resulted in a situation where

[17] Source: DG Shipping provided dataset on shipyards

Indian shipyards are unable to meet the growing demand for ships in the domestic market, leading to increased dependence on foreign shipyards. To address this issue, there is a need for targeted policies and incentives to encourage domestic shipbuilding and reduce the reliance on imports.

3.3 Volume of shipbuilding in India and turnaround time

The volume of shipbuilding in India is relatively low compared to major shipbuilding nations. The limited number of shipyards and their capacity constraints have resulted in a low tonnage of ships being delivered. For instance, the Cochin Shipyard, which has the maximum shipbuilding capacity among public sector shipyards, can only build ships up to 1,10,000 DWT. This capacity is expected to increase to 3,00,000 DWT [18]with the commissioning of a new dry-dock, but it still falls short of the capacities of leading shipyards in countries like China and South Korea.

Turnaround time is another critical issue affecting the Indian shipbuilding industry. The lack of infrastructure, skilled workforce, and advanced technology leads to longer construction times and delays in project completion. This not only affects the competitiveness of Indian shipyards but also results in higher costs for shipowners. To improve the volume of shipbuilding and reduce turnaround times, there is a need for significant investments in infrastructure, technology, and skill development. Additionally, streamlining regulatory processes and providing financial incentives can help attract more orders and boost the industry's growth.

3.4 Capital and operating costs

Indian shipyards face high capital and operating costs, which significantly impact their competitiveness. The cost of raw materials, particularly steel, is a major factor contributing to the high capital costs. India relies heavily on imports for most of the inputs consumed in shipbuilding, which puts additional cost pressures on Indian firms. In contrast, countries like China benefit from being one of the cheapest steel manufacturers in the world, allowing their shipyards to reduce costs and offer lower shipbuilding prices in the global market.

Operating costs are also high due to factors such as high taxation and duties, freight charges, lack of bulk discounts, and high interest costs. Indian banks provide debt funds with a tenor of 5-6 years, which is insufficient for the long-term funding needs of the shipbuilding industry. Additionally, the cost of funds for Indian banks is high, leading to expensive financing options for shipbuilding and repair projects. To address these issues, there is a need for targeted policies to

[18] Rajya Sabha Report on Status of Ship building, Ship repair and Ship breaking industries in the country

reduce the cost of raw materials, provide long-term, low-cost funding options, and streamline regulatory processes to reduce operating costs.

3.5 Availability of skilled workforce

The availability of a skilled workforce is a significant challenge for the Indian shipbuilding industry. The present workforce has limited exposure to global practices and productivity strategies, which affects the overall efficiency and competitiveness of Indian shipyards. Unlike major shipbuilding countries like Japan and South Korea, which have established skill development centres and promoted R&D activities, India has not made significant investments in skill development and innovation in ship designing.

To address this issue, there is a need for targeted initiatives to develop the skills of the existing workforce and attract new talent to the industry. This can be achieved through the establishment of skill development centres, collaboration with educational institutions, and promotion of R&D activities. Additionally, providing financial incentives and support for training programs can help improve the skill levels of the workforce and enhance the overall productivity of Indian shipyards.

3.6 Regulatory and compliance concerns

Regulatory and compliance concerns are major challenges affecting the Indian shipbuilding and ship repair industry. The cumbersome customs procedures and complex conditions for setting up Free Trade Warehousing Zones (FTWZ) hinder the timely delivery of repaired ships and the availability of spare parts. For instance, the process of importing and clearing spare parts can take days or even weeks, leading to delays in ship repairs and increased costs for shipowners.

To address these issues, there is a need for simplifying customs procedures and relaxing FTWZ conditions. This can be achieved by framing industry-friendly import rules, providing exemptions for ship repair materials, and streamlining the customs clearance process. Additionally, adopting best practices from countries like Singapore and UAE, where shipyards enjoy the facility of direct delivery with no constraints, can help improve the efficiency of the Indian ship repair industry.

3.7 Infrastructure and support facilities

The lack of adequate infrastructure and support facilities is a significant challenge for the Indian shipbuilding and ship repair industry. There are only 45 dry-docks for repairing ships in India, and many yards lack the capacity to cater to special types of vessels. The shallow drafts in repair ports limit the ability to accommodate large vessels, resulting in the loss of repair business to foreign countries like China, Singapore, and UAE.

To address these issues, there is a need for developing ship repair clusters with comprehensive infrastructure, ancillary support, and skilled manpower. Suggested locations for these clusters include Chennai, Kochi, and Mumbai. Additionally, investing in the development of specialized repair shops and simplifying customs procedures can help improve the efficiency and competitiveness of the Indian ship repair industry. By addressing these infrastructure challenges, India can position itself as a major ship repair hub and capture a larger share of the global market.

3.8 Challenges in ship designing

India's ship design agencies play a critical role in shaping the foundation of the shipbuilding and repair industry. These agencies are responsible for developing innovative vessel designs, ensuring compliance with international classification standards. The design agencies also address the evolving market and regulatory requirements such as green propulsion and automation. However, despite the technical capabilities of several Indian design firms, they continue to face systemic challenges that restrict their growth and limit their impact on the national shipbuilding agenda.

One of the most pressing challenges is the high initial cost associated with the development of a new vessel design. The creation of a detailed ship design, including hydrostatics, hydrodynamics, structural layout, machinery integration, and outfitting, requires a multidisciplinary approach, significant man-hours, specialized software licenses, and often collaboration with classification societies. In India, where the volume of domestic orders is relatively low, such investments are often not economically justifiable for private design agencies unless backed by large, consistent orders. This leads to a situation where many agencies continue to rely on derivative or incremental design improvements rather than pushing the boundaries with truly innovative or indigenous designs.

This challenge is exacerbated by the limited domestic demand for shipbuilding in the commercial segment. With Indian shipyards collectively handling only a small fraction of global shipbuilding orders (less than 1% of global output), the opportunity for Indian design agencies to offer their services domestically remains constrained. Further, Indian owners often prefer importing vessels or working with international design firms due to established track records, leading to a cycle where local design agencies are not given the platform to demonstrate their capabilities at scale.

Another consequence of the low volume of shipbuilding is the fragile ancillary support ecosystem, which affects both shipyards and design firms. Without consistent orders and product standardization - the availability of components, equipment specifications, and manufacturing

drawings becomes unpredictable. This impacts the ability of design agencies to create efficient, modular, and cost-effective designs that align with the production capabilities of Indian suppliers and fabricators. The lack of local component standardization also limits their ability to reduce lead times and align with Just-in-Time manufacturing philosophies, which have yielded excellent results in major shipbuilding nations globally.

Moreover, design agencies face limited financial support and project-based funding, which further hinders their R&D activities and adoption of advanced tools such as digital twin simulations, AI-driven design optimization, advanced modelling tools etc. In the absence of incentives or grants specifically targeted at the ship design segment, most firms operate with minimal investments in innovation. This restricts their ability to compete with global design firms that have access to government-backed R&D funds and guaranteed orders from domestic shipyards.

Addressing these challenges requires an ecosystem approach, where policy support, long-term chartering commitments, standardization of design templates, and collaboration between shipyards, classification societies, and component manufacturers are all aligned. The proposed Portal aims to act as a catalytic platform by highlighting indigenous design capabilities, facilitating cross-linkages with shipyards and R&D institutions, and attracting project-based investments for advanced design initiatives. Over time, such digital and policy-driven integration will be essential to unlock the full potential of India’s ship building and repair sector.

4. Government initiatives and policies

4. Government initiatives and policies

The Indian government plays a pivotal role in the development and modernization of the shipping industry. In November 2020, the Ministry of Shipping was renamed the Ministry of Ports, Shipping and Waterways, reflecting a broader focus on the sector's growth and sustainability. To attract investment, the government has allowed 100% Foreign Direct Investment (FDI) under the automatic route for port and harbour construction and maintenance projects. Additionally, a 10-year tax holiday is provided to enterprises that develop, maintain, and operate ports, inland waterways, and inland ports.

Under the National Perspective Plan for Sagarmala, six new mega ports are being developed. The Sagarmala project aims to enhance the performance of the country's logistics sector by unlocking the full potential of India's coastline and waterways. This initiative is expected to reduce logistics costs, increase cargo handling capacity, and create new job opportunities.

4.1 Vision and strategic goals for a robust shipbuilding ecosystem in India

The Indian government has set ambitious goals to elevate the country's shipbuilding industry globally. The Maritime India Vision 2030 (MIV 2030) aims to move India's shipbuilding and ship repair ranking into the top 10 globally, while the Amrit Kaal Vision 2047 (MAKV 2047) sets an even more ambitious goal of reaching the top five. These visions are part of a broader strategy to enhance the performance of the country's logistics sector by unlocking the full potential of India's coastline and waterways.

The Maritime India Vision 2030 outlines 150 initiatives aimed at propelling India to global maritime leadership. These initiatives cover various aspects such as port infrastructure development, enhancing logistics efficiency, improving Indian shipbuilding tonnage, increasing coastal and waterway traffic, fostering technology innovation and policy support, promoting sustainability, and encouraging global collaboration. The comprehensive approach ensures that every facet of the maritime ecosystem is addressed, transforming India into a leading maritime nation.

To support these strategic goals, the government has established a Maritime Development Fund (MDF) with a corpus of ₹25,000 crore (approximately US$3 billion). The government will contribute 49% to this fund, with the remainder expected from ports and private investors. This fund is designed to provide long-term financial support to the shipbuilding and repair sectors, addressing the industry's need for sustained capital infusion. The MDF aims to reduce

dependency on foreign lenders, boost domestic ship manufacturing, and foster technological advancements.

4.2 Long-term economic and strategic benefits of a strong shipbuilding industry

A strong shipbuilding and repair industry offers several long-term economic and strategic benefits. Economically, the development of new ports and the enhancement of existing ones are expected to reduce logistics costs, increase cargo handling capacity, and create new job opportunities. The growth in cargo handling, expansion of port infrastructure, and rising coastal and inland waterway operations have led to the creation of jobs in logistics, shipping, port operations, shipbuilding, and related industries.

Strategically, owning a robust fleet of Indian-built ships ensures availability during times of crisis, protects against embargoes, and conserves foreign exchange reserves. A strong domestic shipbuilding industry enhances national security by ensuring that the country has the necessary vessels to support its defence and commercial needs. Additionally, it reduces the reliance on foreign-built ships, which can be critical during geopolitical tensions or trade disruptions.

Technologically, the inclusion of modern technologies and machinery in shipbuilding can lead to advancements in related sectors. The shipbuilding industry often drives innovation in materials, engineering, and manufacturing processes, which can have spillover effects on other industries. By fostering a culture of innovation and technological advancement, the shipbuilding sector can contribute to the overall growth and modernization of the country's industrial base.

4.3 Steps taken by the Indian government to support the shipbuilding sector

The Indian government has initiated several policy measures to revitalize the shipbuilding industry:

- Maritime India Vision 2030 (MIV 2030): Aims to elevate India's shipbuilding and ship repair ranking globally. This vision includes various initiatives such as port infrastructure development, enhancing logistics efficiency, improving Indian shipbuilding tonnage, increasing coastal and waterway traffic, fostering technology innovation and policy support, promoting sustainability, and encouraging global collaboration.
- Maritime Amrit Kaal Vision 2047 (MAKV 2047): Sets a goal to make India one of the top five shipbuilding nations by 2047. This vision focuses on long-term strategic

planning and investments to ensure that India can compete with global leaders in the shipbuilding industry. The government has also revised the Atmanirbhar Bharat Policy in 2020 to focus on self-reliance and boosting domestic manufacturing capabilities.

- Atmanirbhar Bharat Policy (Revised in 2020): Focuses on making India self-reliant by boosting domestic manufacturing capabilities across various sectors, including shipbuilding. Key measures include providing ₹3 lakh crore in collateral-free loans to MSMEs, including those in the shipbuilding sector, to enhance liquidity and support business operations. Additionally, the Partial Credit Guarantee Scheme allocates ₹45,000 crore to NBFCs, HFCs, and MFIs to facilitate fresh lending to MSMEs. The Public Sector Enterprise Policy promotes self-reliance by encouraging public sector enterprises to procure goods and services from domestic manufacturers.
- Standard Operating Procedure (SOP) for Chartering/Procurement of Tugs (2020): Provides guidelines for the procurement of tugs to be built in Indian shipyards. It discourages short-term charters and promotes long-term agreements (minimum of 7 years) to ensure stability and continuous demand for domestically built tugs. The SOP also mandates the development and implementation of standardized tug designs to streamline procurement processes and ensure consistency in quality and specifications. Major ports are required to issue tenders for tugs with a minimum bidding time of 10 weeks, allowing Indian shipyards sufficient time to participate and comply with the standardized designs.
- Pradhan Mantri Matsya Sampada Yojna (2020): Aims to bring about ecologically healthy, economically viable, and socially inclusive development of the fisheries sector. It focuses on increasing fish production and productivity through sustainable practices and modern technologies, establishing infrastructure for post-harvest management, including cold storage, processing units, and transportation facilities, and providing financial assistance and livelihood support to fishermen during the fishing ban/lean period. By enhancing the fisheries sector, the demand for fishing vessels and related infrastructure indirectly supports the shipbuilding industry.
- Financial Assistance Policy on Shipbuilding (2016): Aims to provide financial support to Indian shipyards for shipbuilding contracts signed between April 1, 2016, and March 31, 2026. The policy allocates ₹4,000 crore to provide financial assistance equal to 20% of the lower of the "Contract Price" or the "Fair Price" for each vessel built. It offers higher financial assistance for vessels using green fuels, such as Methanol, Ammonia, Hydrogen fuel cells, and electric or hybrid propulsion systems. Additionally, the policy provides extra financial assistance for the construction of

specialized vessels, such as wind farm installation vessels and sophisticated dredgers.

- Grant of Infrastructure Status (2016): In 2016, the Government of India granted infrastructure status to shipyards, enabling them to avail cheaper long-term capital and invest in capacity expansion. This status allows shipyards to access long-term financing at lower interest rates, reducing their cost disadvantage. It encourages shipyards to invest in modernizing facilities and expanding capacity to meet domestic and international demand. By enhancing the competitiveness of Indian shipyards, this measure provides a level playing field vis-à-vis foreign shipyards.

Among these policy measures, the Maritime India Vision 2030 and Maritime Amrit Kaal Vision 2047 initiatives present the most comprehensive frameworks for the development of the shipbuilding and repair industry in India. Therefore, we will examine these two measures in brief detail in the following section:

4.3.1 Maritime India Vision 2030

Maritime India Vision 2030 (MIV 2030) is a comprehensive framework designed to transform India's maritime sector into a global leader. Launched by the Ministry of Ports, Shipping and Waterways, MIV 2030 outlines 150 initiatives aimed at enhancing port infrastructure, improving logistics efficiency, increasing shipbuilding tonnage, and fostering technological innovation. The vision is structured around ten interconnected themes that address every facet of the maritime ecosystem, ensuring a holistic approach to development.

One of the key objectives of MIV 2030 is to increase the capacity of major ports from 1,598 million metric tonnes per annum (MMTPA) in 2022 to 1,630 MMTPA by 2024. This expansion is expected to reduce vessel turnaround time (TAT) from 53 hours to 48 hours, thereby improving operational efficiency. Additionally, the vision aims to enhance the ship berth day output from 16,000 metric tonnes (MT) to 18,900 MT, reflecting significant improvements in cargo handling capabilities.

To support these ambitious goals, the government has established a Maritime Development Fund (MDF) with a corpus of ₹25,000 crore (approximately US$3 billion). The fund is designed to provide long-term financial support to the shipbuilding and repair sectors, addressing the industry's need for sustained capital infusion. This initiative aims to reduce dependency on foreign lenders, boost domestic ship manufacturing, and foster technological advancements.

Enhancing port infrastructure and logistics efficiency

MIV 2030 places a strong emphasis on enhancing port infrastructure and logistics efficiency. The vision includes the development of six new mega ports under the Sagarmala project, which aims to unlock the full potential of India's coastline and waterways. These new ports are expected to significantly increase cargo handling capacity and reduce logistics costs, thereby boosting the overall efficiency of the maritime sector.

In addition to port development, MIV 2030 focuses on improving coastal and inland waterway traffic. The vision aims to increase the cargo volume handled by national waterways from 108 million metric tonnes (MMT) in 2022 to 133 MMT by 2024. This increase is expected to enhance the connectivity between ports and hinterlands, facilitating smoother and more efficient cargo movement. The vision also includes initiatives to promote the use of coastal shipping as an environmentally friendly and cost-effective mode of transport.

To further enhance logistics efficiency, MIV 2030 outlines measures to reduce vessel turnaround time and improve berth productivity. These measures include the adoption of advanced technologies such as automation, digitalization, and the use of artificial intelligence (AI) in port operations. By leveraging these technologies, the vision aims to streamline port operations, reduce delays, and enhance overall efficiency.

Fostering technological innovation and sustainability

Technological innovation and sustainability are central to the goals of MIV 2030. The vision emphasizes the adoption of cutting-edge technologies to modernize the maritime sector and improve operational efficiency. This includes the use of automation, digitalization, and AI in various aspects of port and ship operations. By embracing these technologies, the vision aims to create a more efficient, transparent, and competitive maritime sector.

Sustainability is another key focus area of MIV 2030. The vision includes initiatives to promote green shipping practices, reduce carbon emissions, and enhance energy efficiency in port and ship operations. This includes the adoption of cleaner fuels, the use of energy-efficient technologies, and the implementation of best practices in environmental management. By prioritizing sustainability, MIV 2030 aims to create a maritime sector that is not only economically viable but also environmentally responsible.

In addition to technological innovation and sustainability, MIV 2030 emphasizes the importance of global collaboration. The vision includes initiatives to strengthen partnerships with leading maritime nations, promote knowledge exchange, and foster international cooperation. By building strong global partnerships, MIV 2030 aims to position India as a key player in the global maritime industry.

4.3.2 Maritime Amrit Kaal Vision 2047 (MAKV 2047)

The Maritime Amrit Kaal Vision 2047 (MAKV 2047) is a strategic blueprint aimed at transforming India's maritime sector into a global powerhouse by 2047. This vision builds on the foundations laid by the Maritime India Vision 2030 (MIV 2030) and sets even more ambitious goals for the future. MAKV 2047 focuses on enhancing port infrastructure, boosting shipbuilding and repair capabilities, promoting green initiatives, and fostering technological innovation.

One of the key components of MAKV 2047 is the modernization and expansion of port infrastructure. The vision includes the development of two new major mega ports at Vadhavan and Galathea Bay, as well as the enhancement of existing deep draft ports such as Deendayal Port Authority (Kandla), V.O. Chidambaranar Port Authority (Tuticorin), and Paradip Port Authority. These ports are designed to handle larger vessels, including Panamax and Cape size ships, and serve as transshipment hubs, significantly increasing India's cargo handling capacity. Additionally, the vision aims to operationalize six new national waterways, further enhancing the connectivity and efficiency of the maritime logistics network.

Enhancing shipbuilding and repair capabilities

MAKV 2047 places a strong emphasis on enhancing India's shipbuilding and repair capabilities. The vision includes the formulation of a revamped Shipbuilding and Ship Repair Policy, aimed at improving domestic capacity and attracting investment. Four shipbuilding and ship repair clusters are planned, fostering an integrated approach to modernizing shipyards and generating employment. These clusters will focus on adopting advanced technologies and best practices to enhance productivity and competitiveness in the global market.

To support these initiatives, the government has introduced several financial incentives and policy measures. The Financial Assistance Policy on Shipbuilding, which provides financial support for shipbuilding contracts, is expected to play a crucial role in boosting domestic shipbuilding activities. Additionally, the Grant of Infrastructure Status to shipyards enables them to access cheaper long-term capital, facilitating capacity expansion and modernization. These measures collectively aim to create a robust and competitive shipbuilding ecosystem in India, capable of meeting both domestic and international demand.

Promoting green initiatives and sustainability

Sustainability is a central theme of MAKV 2047, with several initiatives aimed at reducing the environmental impact of maritime activities. The "Harit Sagar" Green Port Guidelines have been launched to reduce carbon intensity and develop an environmentally friendly ecosystem at major ports. Three major ports—Deendayal Port Authority, Paradip Port Authority, and V.O.

Chidambaranar Port Authority—are being developed as Green Hydrogen/Ammonia Hubs under the National Hydrogen Mission. These hubs will focus on producing and utilizing green hydrogen and ammonia as cleaner alternatives to conventional fuels, significantly reducing greenhouse gas emissions.

The Green Tug Transition Programme (GTTP) is another key initiative under MAKV 2047, aimed at transitioning from conventional fuel-based harbour tugs to greener, more sustainable alternatives. This program is expected to reduce the carbon footprint of port operations and promote the use of cleaner technologies in the maritime sector. Additionally, the Harit Nauka Guidelines have been introduced to facilitate the green transition of inland waterways-based transportation ecosystems. These guidelines promote the use of cleaner fuels, energy-efficient technologies, and best practices in environmental management, ensuring that the growth of the maritime sector is aligned with sustainability goals.

Fostering technological innovation and skill development

Technological innovation and skill development are critical components of MAKV 2047. The vision emphasizes the adoption of cutting-edge technologies to modernize the maritime sector and improve operational efficiency. This includes the use of Very High Frequency (VHF) channels for marine navigation and traffic control, the implementation of a centralized project management system to monitor capital expenditure projects, and the development of smart communication systems. These technological advancements are expected to enhance the efficiency, transparency, and competitiveness of the maritime sector.

Skill development is another key focus area of MAKV 2047. The vision includes initiatives to support Micro, Small, and Medium Enterprises (MSMEs) in shipbuilding and attract seafarers for academic positions in maritime universities and training institutes. These initiatives aim to create a skilled workforce capable of meeting the demands of a rapidly evolving maritime sector. By fostering a culture of innovation and continuous learning, MAKV 2047 aims to position India as a global leader in maritime technology and expertise.

Boosting cruise tourism and global collaboration

MAKV 2047 also aims to boost cruise tourism and enhance global collaboration. The Cruise Bharat Mission, launched in September 2024, aims to double cruise passenger traffic in the country by 2029. This initiative includes the development of six new international cruise terminals, positioning India as a major global cruise destination. By enhancing cruise infrastructure and promoting India as an attractive cruise destination, MAKV 2047 aims to tap into the growing global cruise tourism market and generate significant economic benefits.

Global collaboration is another key aspect of MAKV 2047. The vision includes initiatives to strengthen partnerships with leading maritime nations, promote knowledge exchange, and foster international cooperation. By building strong global partnerships, MAKV 2047 aims to position India as a key player in the global maritime industry and leverage international expertise to drive the growth and modernization of the domestic maritime sector.

5. Introduction to comprehensive shipbuilding and ship repair portal

5. Introduction to comprehensive shipbuilding and ship repair portal

5.1 Background and context for development of the portal

The comprehensive shipbuilding and ship repair portal is a strategic digital initiative designed to modernize, integrate, and enhance the efficiency of India's shipbuilding and ship repair industry. As highlighted in the previous sections, India has a rich maritime history but has struggled to maintain a competitive position in the global shipbuilding market. While China, South Korea, and Japan have leveraged strong government support, and advanced shipbuilding techniques to dominate the industry, India's shipbuilding sector has encountered multiple challenges, hindering its potential and growth.

Recognizing these challenges, DG Shipping, under the Ministry of Ports, Shipping, and Waterways (MoPSW), has undertaken several initiatives, including those outlined in Maritime India Vision 2030 (MIV 2030) and Maritime Amrit Kaal Vision 2047 (MAKV 2047), to revitalize the shipbuilding sector. The proposed portal aligns with these national strategies and serves as a comprehensive, technology-driven solution to bridge industry gaps, enhance collaboration streamline knowledge base, and position India as a global maritime leader.

The Comprehensive Shipbuilding and Ship Repair Portal is a critical step toward transforming India's shipbuilding industry. It addresses longstanding industry challenges by enhancing digital connectivity, improving regulatory transparency, fostering global investment, and promoting workforce development. As India aspires to position itself as a global maritime leader, this portal will be instrumental in bridging the gap between policy vision and on-ground execution.

5.2 Objective of the portal development

The primary purpose of the Comprehensive Shipbuilding and Ship Repair Portal is to act as a one-stop digital platform for all stakeholders in the industry, including shipbuilders, ship repair service providers, investors, regulators, suppliers, research institutions, workforce training bodies etc.

The key objectives of the national shipbuilding and ship repair portal are to:

- Streamline industry-wide collaboration by digitally connecting stakeholders including shipyards, ancillary players, regulatory bodies, R&D institutes, design agencies, financial institutions, insurers, training institutes etc.

- Enhance the global competitiveness of Indian shipyards and allied sectors by improving visibility, market access and showcasing capabilities.
- Promote investment by highlighting funding schemes, financial products, and partnership opportunities from government and private financial institutions.
- Support workforce development through centralized information dissemination on training requirements, certification programs, and availability of skilled manpower.
- Facilitate regulatory compliance by providing up-to-date information on regulations, standards, and classification guidelines.
- Encourage innovation and adoption of sustainable technologies by promoting green practices, R&D collaboration, and technology demonstration use-cases in shipbuilding.
- Provide actionable industry insights through data-driven dashboards for stakeholder performance using capability assessment matrices.
- Enable digital profiling and capability mapping of all maritime stakeholders through structured data collection and standardized templates.
- Serve as a central repository for technical documentation, best practices, and global case studies in shipbuilding and repair.
- Strengthen public-private engagement by fostering structured dialogue, expert interaction, and feedback loops across the maritime value chain.

By integrating digital technologies with the shipbuilding ecosystem, the portal will act as a centralized knowledge & collaboration hub and an enabler for the industry's growth.

5.3 Vision and Mission statements for the portal

The vision and mission of the Portal provide the guiding direction for its design, development, and long-term impact. They reflect the overarching ambition to digitally empower the Indian shipbuilding ecosystem and align it with global standards of innovation, efficiency, and stakeholder collaboration.

Vision

To position Indian shipbuilding and repair industry on global map through a comprehensive digital platform that supports transparency, innovation and industry excellence.

Mission

To build a comprehensive and interactive digital platform that enables seamless stakeholder collaboration, showcases industry capabilities, promotes access to funding and training, and integrates best practices and innovations - ultimately enhancing transparency, efficiency, and global competitiveness of India's shipbuilding and ship repair industry.

6. Scope of the shipbuilding and repair portal

6. Scope of the shipbuilding and repair portal

6.1 Modules and functionalities

The Comprehensive Shipbuilding and Ship Repair Portal is intended to serve as a centralized digital platform that would help address some of the core challenges faced by the Indian shipbuilding and repair industry. By integrating various functionalities, the portal will act as a unified platform for shipyards, regulatory bodies, investors, training institutions, and other stakeholders.

The following sections present an illustrative overview of the key modules that will serve as the foundation of the portal's architecture. These modules have been conceptualized based on the portal's intended functionalities and preliminary stakeholder needs. Supporting details, including tentative workflows and preliminary functional requirements, are provided in Annexure 2 to offer further clarity and context. Based on these preliminary functional requirements, the SI shall be responsible for preparing a detailed Functional Requirements Specification (FRS) document and must obtain formal sign-off from the PMCC.

6.1.1 Capability Insights module

The Capability Insights module is a comprehensive digital portfolio designed to highlight the capabilities, offerings, and credentials of all key stakeholders involved in India's shipbuilding and ship repair ecosystem. It will serve as a centralized showcase platform that brings transparency, global visibility, and credibility to the industry's value chain participants.

Key features:

- Stakeholder capability profiles: Individual profiles for each category of stakeholders. Each profile will capture relevant technical and operational data points reflecting their infrastructure, experience, specialization, and service offerings.
- Project highlights and delivery track records: Showcase past and ongoing projects of stakeholders, with technical details, timelines, partners involved, and outcomes achieved.
- CAF-driven stakeholder insights: The module will integrate inputs from the stakeholder profile and prepare a Capability Assessment Framework (CAF) for select stakeholder category. This will provide standardized capability assessment matrices, developed from stakeholder data submitted during onboarding, subject to verification by the portal administrators. These insights will enable fair visibility and benchmarking across the ecosystem.

- Multimedia-enabled showcases: Stakeholders will be able to upload documents and rich media such as videos, virtual tours, images, and 3D renderings to illustrate their technological strength, infrastructure, products/services portfolios/specification and completed works.
- Search and filter functionality: A dynamic search interface will allow users to search for stakeholders based on capabilities, project history, location, classification, service type, or technological specialization.

Illustrative list of potential benefits for key stakeholders is provided below for reference:

Stakeholder Category (not exhaustive)	Role in the Module	Key Benefits
Shipyards	Share capabilities, highlight past builds, participate in collaboration hub etc.	Increased global visibility, marketing for business development
Design agencies	Share design expertise, project types, software used, past projects, clientele, etc.	Visibility to potential collaborators and shipyards
Ancillary industries	Showcase product/service categories, specifications, brochures and certifications, etc.	Improved discoverability and partnership opportunities
R&D agencies	Display ongoing research and innovation focus areas, etc.	Access to partnerships and funding opportunities
State Maritime Boards	Provide regional maritime infrastructure data, regulatory support, and promote local capabilities, etc.	Enhanced visibility of state-level maritime assets, facilitation of regional collaboration, and informed policy-making
Financial institutions & insurers	Display financial products or insurance covers available, etc.	Greater outreach to potential clients with specific needs
Ship Owners	Share fleet requirements, repair requirements, and future build plans; engage with shipyards and service providers, etc.	Better alignment with shipyard capabilities, streamlined access to repair and build services, and enhanced collaboration opportunities

Stakeholder Category (not exhaustive)	Role in the Module	Key Benefits
Training & skill development bodies	Show facilities, trainers, courses, certifications offered, etc.	Better engagement with shipyards and other stakeholders
Classification societies & test labs	Highlight certification expertise, domain knowledge, etc.	Discoverability for yard evaluations and assessments

Note: The above list is only for illustration and not exhaustive. Other stakeholders will also be involved, contributing to module's functionality and deriving benefits based on their respective roles and responsibilities.

The Capability Insights module will become a one-stop portfolio engine—positioning Indian maritime capabilities for both domestic and global engagement. With equal focus on every stakeholder category, it will drive greater trust, discoverability, collaboration, and business generation across the entire Indian shipbuilding and ship repair value chain.

6.1.2 Collaboration hub module

The Collaboration Hub module is envisioned as a dynamic, interactive, and structured digital environment where all stakeholders across the Indian shipbuilding and ship repair value chain can engage, collaborate, share insights, and coordinate on specific projects.

Designed with following three core functionalities, the module aims to bridge communication gaps, promote transparency, and accelerate innovation.

Core functionalities

1. Discussions and Q&A (for knowledge exchange): A structured space for stakeholders to raise industry-related questions and share verified answers. Topics may cover regulations, technical challenges, best practices, training, financing, R&D, green shipping, etc.
2. Industry-wide discussion posts and updates (for social feeds): A collaborative feed where stakeholders can post updates, opinion pieces, event summaries, project news, or calls for partnership. The format will allow comments, likes, user tagging, and multimedia content sharing.
3. Private group collaboration (Project-based closed groups): Secure virtual spaces for stakeholders to collaborate on specific projects (e.g., a new ship design, green retrofit,

policy consultations). Members can share documents, set milestones, and track discussions within the group.

Key features

- Role-based access and engagement: Stakeholders will have defined roles and privileges e.g., government moderators for regulation threads, verified experts for responding to queries, project leads for managing private groups.
- Multimedia-enabled sharing: Users can post/share documents relevant to technical or commercial collaborations.
- Moderation and verification: Discussions on regulatory topics, public policy, and certification will be moderated by authorized bodies such as DGS. The system integrator shall implement automated moderation tools equipped with notification and logging functionalities to support this process. Designated DGS administrators will have the authority to take appropriate actions, including content removal, user access revocation, etc. based on moderation outcomes.
- Notification and tagging system: Users can follow threads, receive notifications on replies, and tag other users or institutions.
- Polls and opinion surveys: Quick feedback tools on industry sentiment or emerging policy proposals.
- Personal messaging: Users will be able to send private messages to any other user on platform. Upon sending a message, the recipient will receive automated notifications via email and/or SMS, based on their selected communication preferences.

Illustrative list of potential benefits for key stakeholders is provided below for reference:

Stakeholder Category (not exhaustive)	Roles in Collaboration Hub	Benefits
Shipyards & Repair Yards	Initiate and participate in technical and operational discussions, form project collaboration groups, etc.	Access to expertise, vendors, technology insights, regulators etc. for project acquisition & coordination
Regulators (DGS, etc.)	Post verified updates, moderate compliance forums, clarify policy matters, etc.	Transparency, better industry feedback, streamlined communication

Stakeholder Category (not exhaustive)	Roles in Collaboration Hub	Benefits
Design Agencies & R&D Centres	Share design knowledge, collaborate on innovation threads, join project-specific groups, etc.	Platform for visibility, joint R&D, and connecting with shipyards or tech adopters
Training Institutes	Share course information, answer queries related to upskilling, etc.	Increased outreach and ability to match training to real-time industry needs
Ancillary Industry	Promote products, services & available technologies, participate in solution-finding discussions, etc.	Visibility to shipyards, faster response to technical needs
Investors & Financial Institutions	Engage in financing discussions, clarify funding options, observe pipeline projects, etc.	Better understanding of market needs, increased funding opportunities
Classification Societies	Respond to compliance queries, share updates on classification processes, etc.	Credible knowledge sharing, enhanced regulatory alignment
State Maritime Boards	Share updates on regional maritime infrastructure, facilitate local stakeholder engagement, and participate in policy and operational discussions, etc.	Improved coordination with industry players, visibility into regional capabilities, and support for policy alignment and infrastructure planning
Ship Owners	Engage in discussions on fleet needs, operational challenges, and collaboration opportunities with shipyards, regulators, and service providers, etc.	Access to tailored solutions, faster response to maintenance and retrofit needs, and stronger industry partnerships
Insurance Providers	Participate in risk-related discussions, promote sector-specific insurance products, etc.	Promote awareness, clarify risk mitigation protocols

Note: The above list is only for illustration and not exhaustive. Other stakeholders will also be involved, contributing to module's functionality and deriving benefits based on their respective roles and responsibilities.

The Collaboration Hub will be a digital forum, knowledge base, and project workspace all rolled into one. By enabling rich stakeholder interaction, the module will help improve industry awareness, shorten project coordination cycles, and foster a spirit of co-development and innovation across the sector.

6.1.3 Training & certification module

The Training & certification module is a dedicated, informative, and centralized platform aimed at strengthening the skill base of the Indian shipbuilding and ship repair industry by providing structured information on relevant training programs, certification schemes, and training institutions. It will serve as a critical enabler for bridging the skill gap in the industry by aligning training availability with evolving technological and regulatory requirements.

Rather than delivering training directly, this module will aggregate and present information from accredited institutes, government programs, classification societies, and industry-led certification bodies. It will also facilitate visibility for training centres and promote greater engagement between stakeholders responsible for capacity building.

Key features

- Training course repository: A categorized listing of available training programs across domains such as welding, CNC operation, ship design software, digital twin technology, green fuel handling, automation, safety compliance etc.
- Training institute profiling: Verified profiles of training centres, shipyard-affiliated training units, and technical institutions providing skill development relevant to shipbuilding and repair industry.
- Eligibility filters & search tools: Candidates and employers can filter training options based on eligibility, duration, location, mode (online/offline), certification authority, and skill category.
- Update notifications and outreach: Notifications for new training program launches, changes in regulatory training mandates, and scholarship/incentive announcements.

Illustrative list of potential benefits for key stakeholders is provided below for reference:

Stakeholder Category (not exhaustive)	Role in the Module	Key Benefits
Shipyards and repair yards	Identify available training programs for workforce hiring or internal upskilling, etc.	Build a skilled and compliant workforce aligned with modern shipbuilding needs
Training institutions	List training programs, update schedules and seat availability, etc.	Wider outreach, increased enrolments, and alignment with industry needs

Stakeholder Category (not exhaustive)	Role in the Module	Key Benefits
DG Shipping & regulatory bodies	Publish approved certification schemes as required, monitor adherence to standards, etc.	Improve compliance, promote standardization and safety awareness
Students and professionals	Access available training and certification opportunities relevant to their skillset, etc.	Improved employability and sectoral integration

Note: The above list is only for illustration and not exhaustive. Other stakeholders will also be involved, contributing to module's functionality and deriving benefits based on their respective roles and responsibilities.

This module will become a sectoral training intelligence hub, promoting transparent access to skill-building opportunities and certifications. By enabling workforce alignment with industry requirements, the module will support a future-ready, globally competent Indian shipbuilding ecosystem.

6.1.4 Finance & insurance module

The Finance & Insurance Module will serve as a centralized platform for providing structured information on financial assistance schemes, investment opportunities, and insurance products relevant to the shipbuilding and ship repair industry.

This module will connect shipyards, investors, financial institutions, insurers, and other stakeholders, thereby facilitating access to funding, risk coverage options, and investment opportunities available for the sector.

It will ensure transparency in the availability of funding schemes and insurance solutions and promote greater industry participation.

Key features

- Government subsidy and grant information: Comprehensive listing of central and state government assistance programs for shipyards, fleet modernization, ship repairs, green retrofits, R&D, ship design, etc. Linkages to external portals (e.g., SBFAP portal) through APIs for easy navigation (no direct processing on this portal).
- Loan and credit schemes: Information on financial products offered by banks, NBFCs, and other financial institutions tailored to shipyards, ancillary industry players, and other stakeholders.

- Investment opportunity showcase: Highlight investment opportunities in public and private shipyard projects, maritime/shipyard clusters, port-linked infrastructure, and green shipping initiatives.
- Insurance products and services: Information on insurance offerings covering shipbuilding risks, ship repair risks, and emerging insurance products for green vessels and retrofitting.
- Guidance and knowledge repository: Resources such as financing FAQs, model insurance policies, guidelines for risk mitigation in shipbuilding/repair projects, and financial literacy initiatives for shipyards and other stakeholders.

Illustrative list of potential benefits for key stakeholders is provided below for reference:

Stakeholder Category (not exhaustive)	Role in the Module	Key Benefits
Shipyards and repair yards	Discover financing options and insurance solutions for projects and operations, etc.	Access to capital, reduced financial risk, improved project insurability
Financial institutions	List available financial products, interact with potential borrowers, etc.	Wider client outreach, focused promotion of sector-specific credit instruments
Investors (domestic & international)	Explore curated investment opportunities in Indian shipbuilding and repair sector, etc.	Greater visibility of potential investments and structured deal sourcing
Insurance companies	Showcase insurance products customized for shipbuilding and repair activities, etc.	Targeted promotion of insurance offerings and market expansion

Note: The above list is only for illustration and not exhaustive. Other stakeholders will also be involved, contributing to module's functionality and deriving benefits based on their respective roles and responsibilities.

By connecting the shipbuilding ecosystem with financial and insurance support, this module will lower entry barriers, de-risk operations, and attract capital inflows necessary to propel India's shipbuilding and repair sector towards global competitiveness.

6.1.5 Innovation centre module

The Innovation centre module will serve as a dedicated digital platform to drive research collaboration, technological advancement, and sustainability initiatives within India's shipbuilding and ship repair industry.

It will connect shipyards, R&D institutions, design agencies, ancillary manufacturers, ports, regulators, technology innovators and other stakeholders to foster a culture of innovation, knowledge exchange, and adoption of cutting-edge solutions aligned with India's maritime goals under MIV 2030 and MAKV 2047.

The module will also promote the development and visibility of green technologies, advanced manufacturing techniques, and next-generation shipbuilding capabilities.

Key features

- Technology demonstration hub: A space to showcase new technologies through virtual simulations, case studies, 3D models, and video demonstrations, aimed at improving awareness, adoption, and scaling of advanced shipbuilding methods.
- Green shipbuilding initiatives: Promotion and dissemination of technologies related to LNG-fuelled ships, hydrogen and ammonia propulsion, electric vessels, shore power integration, hybrid designs, and other low-emission solutions.
- Knowledge repository: Central repository of whitepapers, academic publications, research publications, patents, technical guidelines, and emerging trends on sustainable shipbuilding & advanced marine technologies from R&D organizations, universities, and innovation hubs.

Illustrative list of potential benefits for key stakeholders is provided below for reference:

Stakeholder Category (not exhaustive)	Role in the Module	Key Benefits
Shipyards and repair yards	Gain knowledge about and adopt innovative solutions, etc.	Access to cutting-edge technologies, competitive edge in global markets
R&D institutions and universities	Showcase research capabilities and engage in collaborative projects, etc.	Increased research funding, real-world application of innovations
Design agencies	Integrate innovative designs and sustainable practices into shipbuilding, etc.	Access to futuristic concepts, green design development opportunities
Ancillary industry players	Collaborate on material innovation, green retrofits, and component upgrades, etc.	Expansion of market opportunities through supply of advanced products

Stakeholder Category (not exhaustive)	Role in the Module	Key Benefits
Ports and marine infrastructure agencies	Adopt green technologies and improve port facilities for new ship designs, etc.	Sustainable port development, alignment with IMO decarbonization goals
Government and regulatory bodies (DG Shipping, MoPSW etc.)	Promote green compliance and support industry innovation policy, etc.	Enhanced regulatory compliance, policy-driven innovation growth
Investors and financial institutions	Identify and fund commercially viable innovations and startups, etc.	Access to pipeline of high-potential maritime innovations and technologies

Note: The above list is only for illustration and not exhaustive. Other stakeholders will also be involved, contributing to module's functionality and deriving benefits based on their respective roles and responsibilities.

The Innovation Centre Module will act as a catalyst for India's shipbuilding sector to leapfrog into green, sustainable, and technology-driven manufacturing, positioning India as a global innovation hub in the maritime industry.

6.1.6 Technical library module

The Technical library module will act as a centralized repository for a wide range of technical documents, industry guidelines, standards, manuals, design templates, and global best practices essential for the shipbuilding and ship repair ecosystem. It will provide authoritative, verified, and up-to-date information to support technical excellence, regulatory compliance, innovation, and standardization across the industry.

The module will cater to all key stakeholders including shipyards, design agencies, regulators, classification societies, ancillary suppliers, training institutes, research institutions, and consultants.

Key features

- Technical documents repository: Central access to blueprints, ship design specifications, hull construction standards, machinery specifications, materials guidelines, and component drawings.
- Best practices and case studies: A curated library of global and domestic best practices in shipbuilding, green shipping advancements, retrofitting, ship repair technologies, and sustainability innovations.

- Standard templates and manuals: Downloadable standard templates for shipbuilding documentation (e.g., quality control checklists, welding manuals, safety protocols, dry-dock maintenance procedures).
- Searchable archive with tagging: Intelligent keyword tagging and advanced search functionalities to ensure that users quickly find relevant documents.

Illustrative list of potential benefits for key stakeholders is provided below for reference:

Stakeholder Category (not exhaustive)	Role in the Module	Key Benefits
Shipyards and repair yards	Access technical standards and design documents, etc.	Improve construction quality, standardization, compliance with international norms
Design agencies	Reference design templates, specifications, and global case studies, etc.	Enhance innovation, reduce errors, faster design development
Ancillary industry players	Access technical specs for components, materials, and systems, etc.	Align products with shipyard and regulatory expectations
Training centres and institutes	Use reference materials for curriculum development, etc.	Deliver industry-aligned workforce training
R&D institutions	Disseminate research outputs and technical studies, etc.	Encourage faster industry adoption of R&D outcomes
Consultants	Refer to best practices and guidelines for advisory projects, etc.	Strengthen technical advisory services for shipbuilding and repair stakeholders

Note: The above list is only for illustration and not exhaustive. Other stakeholders will also be involved, contributing to module's functionality and deriving benefits based on their respective roles and responsibilities.

The Technical library module will be the knowledge backbone of the portal, standardizing technical practices and ensuring that every stakeholder in India's shipbuilding and repair ecosystem has easy access to critical technical resources, thereby enhancing operational excellence, innovation, and compliance.

6.1.7 Regulatory & compliance module

The Regulatory & compliance module will serve as a central repository for national and international maritime regulations, governmental policies & guidelines, classification society guidelines, safety codes, and environmental compliance requirements relevant to the shipbuilding and ship repair industry.

It will ensure that all stakeholders have timely access to regulatory information, helping them stay compliant, reduce compliance risks, and improve operational transparency.

This module will cater to shipyards, repair facilities, design agencies, classification societies, regulators, ports, financial institutions, insurers, and consultants.

Key features

- Regulatory document repository: Centralized access to IMO regulations, DG Shipping circulars, BIS standards, classification society requirements & rules, and environmental compliance requirements.
- Compliance updates: Timely updates on changes in maritime regulations, safety protocols, ship construction and repair standards, and environmental laws.
- FAQ and guidance section: A dedicated section offering simplified guidance notes, FAQs, and explanatory material on complex regulations for easier understanding, where available.
- Integration with classification societies and regulatory bodies: Potential dynamic linkages and possible API integrations with classification societies (like IRS, DNV, ABS) and regulatory authorities for real-time updates.

Illustrative list of potential benefits for key stakeholders is provided below for reference:

Stakeholder Category (not exhaustive)	Role in the Module	Key Benefits
Shipyards and repair yards	Access regulations, standards, and compliance requirements, etc.	Ensure adherence to global shipbuilding norms, minimize compliance risks
Design agencies	Access shipbuilding standards and design compliance rules, etc.	Improve regulatory alignment in ship design
Classification societies	Share updated classification rules, standards, and guidelines, etc.	Promote regulatory standardization

Stakeholder Category (not exhaustive)	Role in the Module	Key Benefits
Regulators (e.g., DG Shipping)	Post regulations, circulars, compliance requirements, policy etc.	Ensure wider dissemination and compliance awareness
Ports and terminal operators	Stay updated on compliance rules	Improve coordination between shipbuilding and port regulatory needs
Financial institutions and insurers	Reference industry regulations for their risk assessment in lending and insurance underwriting, etc.	Make informed funding and risk decisions
Consultants	Use regulatory updates for advisory services, etc.	Offer informed regulatory and compliance consulting to stakeholders

Note: The above list is only for illustration and not exhaustive. Other stakeholders will also be involved, contributing to module's functionality and deriving benefits based on their respective roles and responsibilities.

The Regulatory & compliance module will act as a regulatory compass for the Indian shipbuilding and ship repair industry, helping all stakeholders stay updated, compliant, and aligned with national and international standards, thus enhancing industry credibility, safety, and global competitiveness.

6.1.8 Industry directory module

The Industry directory module will serve as a comprehensive digital repository of key stakeholders operating across the shipbuilding and ship repair ecosystem. It will provide structured, verified, and easily accessible profiles of organizations involved in shipbuilding, ship repair, ancillary support, research, training, financial services, insurance, consultancy, infrastructure development etc.

This module aims to strengthen connectivity, enhance collaboration, and facilitate market access for all industry participants.

Key features

- Shipyard and ship repair yard listings: Contact profiles of public sector and private sector shipyards and repair facilities.

- Ancillary suppliers and service providers directory: Listings of material suppliers, equipment manufacturers, technology providers, logistics service providers, and other support industries.
- Design agencies and R&D institutions: Directory of naval architecture firms, marine engineering agencies, R&D centres, and innovation hubs involved in shipbuilding technology development.
- Training institutes and skill development centres: Contact details of training organizations offering courses for shipyard workers, engineers, welders, and maritime professionals.
- Financial institutions and insurers: Listings of banks, NBFCs, and insurance providers offering funding or risk management products for the sector.
- Regulators, classification societies, and ports: Directory of contacts in DG Shipping, classification societies (IRS, DNV, etc.), port authorities, and related regulatory bodies.
- Consultants and infrastructure firms: Directory of technical and management consultants, and infrastructure developers specializing in shipyard, dry dock, and coastal facility development.

Stakeholder benefits

The Industry Directory Module will act as a single-window platform to discover, connect, and collaborate with key players across the shipbuilding and ship repair industry, thereby strengthening market integration, improving access to services and finance, and enhancing sectoral transparency and coordination.

6.1.9 Integration of features for a unified digital ecosystem

The portal will be designed as an integrated platform where each module complements the others, creating a seamless and interconnected digital ecosystems for all stakeholders in the shipbuilding and ship repair industry.

This holistic integration will ensure a user-centric experience and maximize the functional value of the portal for every stakeholder group.

Some examples of feature interconnections:

- Shipyards and repair yards listed in the Industry Directory will have links to:
  - Their detailed capability profiles and past projects in the Capability Insights module.

- Relevant training programs showcased under the Training & certification module for upskilling their workforce.
- Financial assistance schemes highlighted under the Finance and Insurance module to support capacity expansion.

- Design agencies, ancillary suppliers, and R&D centres will be able to:
  - Display their innovations and product offerings under the Capability Insights module.
  - Collaborate with shipyards and investors through private project groups in the Collaboration Hub module.
  - Stay updated on the latest global standards and best practices through the Technical Library module.
- Investors and financial institutions will benefit from:
  - Accessing shipyard profiles, ancillary player information, and innovation-driven projects through the Capability Insights module.
  - Exploring funding opportunities, government subsidies, and insurance products in the Finance and Insurance module.
  - Using Collaboration Hub to interact directly with industry players seeking investment.
- Training centres and skill development institutes will:
  - Showcase their courses in the Training & certification module.
  - Engage with shipyards and ports to align workforce training programs through the Collaboration Hub.
- Ports, infrastructure developers, and consultants will:
  - Share their capabilities and consulting expertise in the Capability Insights module.
  - Participate in sector-wide discussions through the Collaboration Hub.
  - Stay updated on evolving regulatory and compliance frameworks through the Regulatory & compliance module.
- Regulators and classification societies will:
  - Post official updates, regulatory changes, and notifications within the Regulatory and Compliance module.

- Facilitate better compliance and awareness among industry participants via direct engagements in the Collaboration Hub.

- Dynamic document connectivity across modules - To ensure seamless access and maximize the utility of uploaded content, document repositories across various modules will have dynamic interlinkages based on intelligent tagging. key functionalities will include:
  - Technical documents uploaded by users can be tagged (by the document owner and/or designated approver) to appear under the Innovation Centre module wherever relevant to research, technology advancement, or sustainability initiatives.
  - Research publications and academic documents can be tagged (by the owner and/or approver) for inclusion in the Technical Library module to enrich the industry's knowledge base.
  - Regulatory and compliance-related documents can only be tagged by authorized users (regulators and designated approvers) for publication under the Regulatory and Compliance module, ensuring authenticity and validation.
  - Documents carrying multiple relevant tags will be dynamically visible under all applicable modules, thus avoiding duplication while maintaining module-specific relevance.

  This interconnected tagging approach will facilitate centralized data management, improve cross-referencing between modules, and ensure a coherent and efficient user experience across the portal.

Benefits of this unified ecosystem:

- Seamless navigation and interlinking of related information for all users.
- Efficient knowledge sharing across industry segments.
- Enhanced collaboration opportunities between complementary stakeholder groups.
- Centralized access to updated regulatory, financial, technical, and workforce information.
- Accelerated digital transformation of the Indian shipbuilding and ship repair industry, aligning with national maritime development goals.

This integrated, multi-stakeholder approach will ensure that the portal serves as a dynamic enabler for India's shipbuilding growth story, fostering greater collaboration, transparency, efficiency, and global competitiveness.

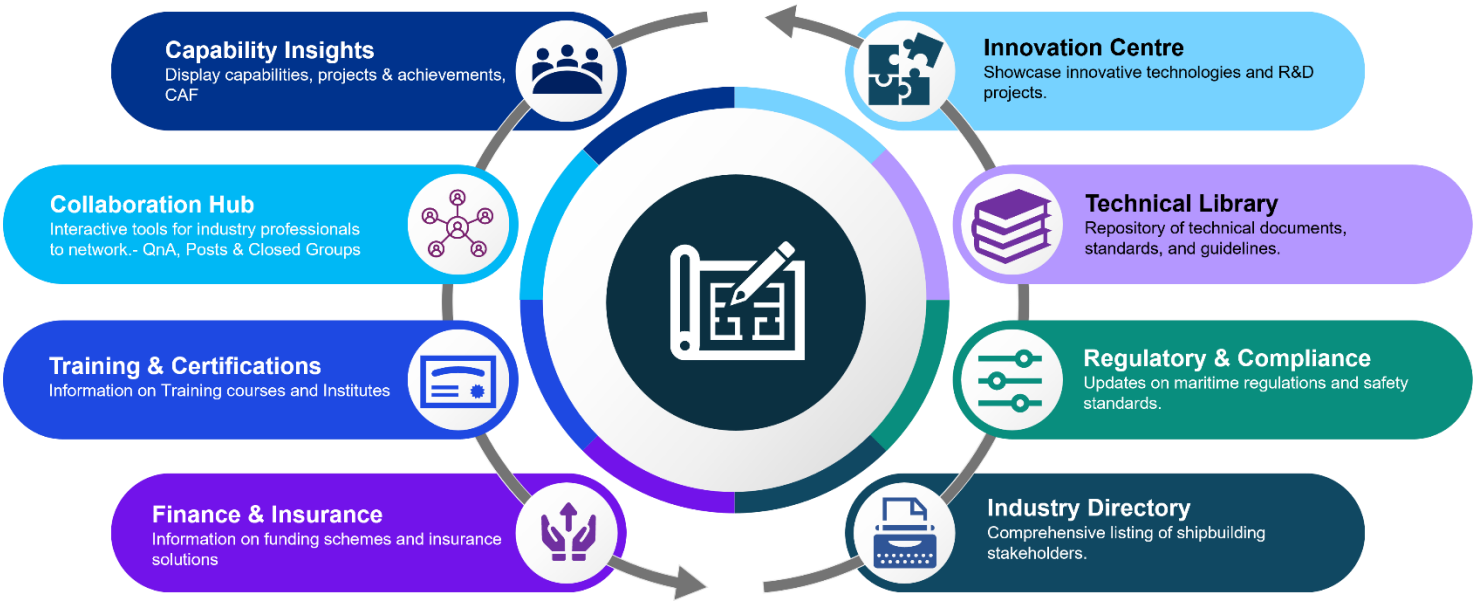

Capability Insights
Display capabilities, projects & achievements, CAF
Collaboration Hub
Interactive tools for industry professionals to network.- QnA, Posts & Closed Groups
Training & Certifications
Information on Training courses and Institutes
Finance & Insurance
Information on funding schemes and insurance solutions
Innovation Centre
Showcase innovative technologies and R&D projects.
Technical Library
Repository of technical documents, standards, and guidelines.
Regulatory & Compliance
Updates on maritime regulations and safety standards.
Industry Directory
Comprehensive listing of shipbuilding stakeholders.

Figure 5 Modules of comprehensive portal

6.2 List of key users and stakeholders

The portal intends to onboard all the stakeholders in Indian shipbuilding and ship repair ecosystem. Following stakeholders have been identified for this purpose:

- Government bodies and regulatory authorities
- Shipyards and ship repair yards
- Industry associations and trade bodies
- Shipboard equipment, material and machinery suppliers
- Shipbuilding and ship repair ancillary service providers
- Ship design agencies
- Classification societies
- Skill development agencies
- Financial institutions and insurance providers
- Research and development (R&D) organization and academic institutions
- Shipping and logistics companies
- Ports
- Ship model test facilities and other testing facilities and laboratories
- Shipbuilding / marine infrastructure agencies
- Shipyard machinery suppliers

7. Benefits of the portal

7. Benefits of the portal

The portal will unlock significant advantages for all stakeholders by:

- reducing inefficiencies due to lack of information & coordination
- improving the potential for design standardization
- promoting research opportunities
- optimizing costs and timelines, and
- improving overall industry transparency.

With the envisioned functionalities, the portal is designed to deliver meaningful advantages to a diverse set of stakeholders. While the following list outlines some of the key benefits, it is not exhaustive and additional value may emerge as the portal evolves and is adopted more widely:

7.1 Benefits for shipyards and ship repair facilities

- Improved global visibility: Shipyards can showcase their capabilities, past projects, and infrastructure to attract international clients and investors.
- Access to investment and financial support: Direct links to government incentive programs, available private financing options, and procurement opportunities.
- Standardization of design: Potential for design standardization in shipbuilding improving operational efficiency, cost optimization and reduced timelines.
- Access to skilled worker dataset: Enables shipyards to identify and recruit certified professionals through a dynamic workforce database, categorized by skill type, experience, and location, ensuring efficient workforce planning and reduced hiring delays.
- Digital directory: A digital directory to connect with vendors, equipment manufacturers, and ancillary service providers.
- Workforce upskilling opportunities: Access to information on training programs and certification courses, enabling them to enhance workforce skills and stay updated with industry advancements.
- Access to R&D insights: Enables shipyards to stay updated on cutting-edge research, new shipbuilding technologies, and innovative design methodologies, fostering innovation and competitive advantage

7.2 Benefits for product suppliers

(e.g., steel, propulsion systems, electrical components, paints)

- Product visibility and buyer discovery: Suppliers can create digital profiles showcasing product specifications, quality certifications, and production capabilities—making them easily discoverable by shipyards and design agencies.
- Integration into supply chain: Suppliers can gain direct access to shipbuilding and ship repair project data, enabling timely coordination with buyers and alignment of manufacturing schedules with demand.
- Standard specification reference: Access to industry standards and design templates allows suppliers to align their offerings with technical requirements specified by designers, shipyards, and classification societies.
- Innovation promotion: Suppliers of advanced materials and green technologies can feature their innovations in the Innovation Centre, gaining visibility among forward-looking shipyards and R&D bodies.
- Connection with certification bodies: Streamlined communication with testing labs and certification authorities to ensure product compliance for marine-grade use.
- Opportunities for localization initiatives: The portal promotes ‘Make in India’ efforts by highlighting indigenous suppliers and creating a platform for import substitution through visibility of Indian capabilities.

7.3 Benefits for ancillary service providers

(e.g., inspection, calibration, testing, NDT, maintenance)

- Service portfolio showcase: Service providers can list their offerings, geographical coverage, and specializations (e.g., NDT, fire protection, automation diagnostics) for shipyard access.
- Real-time demand insights: Access to posted ship repair and retrofit needs enables targeted outreach and timely service deployment.
- Collaboration on ship repair projects: Through project-based discussion spaces, providers can join collaborative teams on repair, retrofit, or conversion projects and respond to technical support requests.

- Skills & training access: Exposure to new technologies and access to workforce training information helps ensure service delivery aligns with modern shipbuilding and repair practices.

7.4 Benefits for equipment manufacturers

(e.g., winches, HVAC systems, engines, electronics)

- Equipment demonstration & technical integration: Equipment providers can upload product videos, performance specs, and 3D renders in the Capability insight or Innovation centre to demonstrate integration possibilities with various vessel types.
- Client base expansion: Direct engagement with shipyards, design agencies, and ports for pitching solutions, with full visibility of upcoming projects where such equipment may be required.
- Technical compliance assistance: Access to classification guidelines, IMO standards, and regulatory updates via the Regulatory module ensures that equipment aligns with current marine certification needs.
- Inclusion in standard design templates: High-quality, compliant, and scalable products may be integrated into baseline ship design templates by agencies, giving them repeat visibility.
- After-sales & maintenance network expansion: By joining the service provider network and directory, equipment manufacturers can develop stronger downstream repair and maintenance coverage.

7.5 Benefits for ship design agencies

- Visibility and client outreach: Design agencies can showcase their specializations, past projects, and design innovations through detailed profiles, attracting potential shipyard clients and investors from both domestic and international markets.
- Collaboration with shipyards and research bodies: The portal's collaboration hub enables joint discussions, real-time problem-solving, and project-based engagement with shipyards, R&D agencies, and classification societies to co-develop efficient, compliant vessel designs.
- Promotion of indigenous designs: Through the capability insights and Iinnovation modules, design agencies can highlight successful indigenous designs and promote them as standard templates for Indian shipyards, enhancing scalability and design reuse.

- Access to regulatory and technical standards: Direct access to updated classification society norms, IMO regulations, and other industry standards through the technical library and Regulatory modules ensures that designs meet global safety and environmental benchmarks.
- R&D facilitation and innovation visibility: The innovation centre supports co-creation with R&D institutions, enabling design agencies to stay ahead of evolving technologies such as digital twins, autonomous vessel features, and low-emission hull design.
- Market demand analysis and trend tracking: Agencies can track market demand through insights into upcoming shipbuilding projects and stakeholder needs, enabling them to tailor their services and pitch relevant designs proactively.
- Engagement with skilled workforce and training bodies: Design agencies can access data on certified naval architects and CAD experts and connect with training institutes offering programs relevant to their technological and design software requirements.
- Financial linkages and government support information: The financial assistance module provides visibility into relevant grants, subsidies (e.g., for developing green ship designs), and collaborative funding opportunities with shipyards or research institutions.

7.6 Benefits for financial and insurance institutions

- Centralized visibility of shipbuilding pipeline: Access to real-time data on upcoming and ongoing shipbuilding and ship repair projects, helping institutions assess financing and insurance demand with improved accuracy.
- Showcasing financial products and services: The portal will allow banks, NBFCs, and insurance providers to list and promote customized financial products, such as credit lines, equipment leasing, working capital financing, insurance, and risk covers.
- Improved creditworthiness assessment: Standardized data profiles and Capability Assessment Frameworks (CAF) of shipyards and other stakeholders will aid in more informed risk evaluation for lending and insurance underwriting.
- Enhanced market outreach: Direct access to a focused and growing network of shipyards, ancillary suppliers, and infrastructure firms enables institutions to expand client base and target financing opportunities effectively.
- Policy and incentive tracking: Real-time updates on government subsidies, schemes (e.g., SBFAP), and evolving policy frameworks will help financial institutions align their offerings to capitalize on emerging industry incentives.

- Data-driven decision making: Analytical dashboards and performance insights can support strategic planning, product development, and risk mitigation strategies for both lenders and insurers.
- Opportunity to support green financing: Visibility into shipyards adopting green technologies will allow institutions to offer sustainability-linked financing or insurance products, in line with ESG goals and regulatory trends.

7.7 Benefits for R&D organizations

- Visibility for ongoing and completed research: R&D institutions can showcase current research projects, prototypes, and technology demonstrators in the innovation centre, increasing their visibility among shipyards, design agencies, and investors.
- Collaborative innovation opportunities: The portal enables structured collaboration with shipyards, ancillary suppliers, training centres, and regulators to co-develop solutions for green shipbuilding, automation, alternative fuels, and design optimization.
- Access to industry problem statements: By participating in the collaboration hub and industry discussions, R&D agencies gain first-hand insights into real-world technical challenges faced by shipbuilders and repair yards—helping shape targeted, applicable research.
- Integration into standard design and compliance workflows: Research outputs validated through the portal can potentially be adopted into standard vessel design templates and regulatory guidelines, fast-tracking innovation adoption across the industry.
- Funding opportunity visibility: Through the financial assistance module, R&D institutions can access information on available government R&D grants, innovation funds, and private funding schemes aligned to maritime innovation.
- Technology dissemination support: The portal allows institutions to publish white papers, case studies, and knowledge materials through the technical library, helping disseminate best practices and promote wider adoption of research outcomes.
- Long-term engagement with ecosystem stakeholders: Continuous engagement with shipyards, ports, training institutes, and classification societies positions R&D bodies as strategic enablers of the industrial ecosystem’s transformation.

7.8 Benefits for skill development training institutions

- Visibility of training programs: Institutions can list their programs, certifications, facilities, and trainer credentials within the training & certification module, improving visibility among shipyards, design agencies, and job seekers.

- Increased enrolment and outreach: By reaching a broader industry audience through the portal, institutes can attract more participants, including external candidates, shipyard employees, and students from maritime academies.
- Alignment with industry needs: Engagement with shipyards, design agencies, and regulators through the collaboration hub allows institutes to receive feedback and insights into emerging skill gaps, allowing better planning of course offerings, scheduling, geographic outreach, and update course content accordingly.
- Support in accreditation and curriculum development: Training institutes can collaborate with classification societies and regulatory bodies to ensure that their courses meet international and domestic certification norms.
- Collaboration in industry projects: Institutes may be invited to participate in innovation or retrofit projects requiring training support, thus gaining access to real-world applications and improving training outcomes.
- Promotion of specialized programs: Institutes focusing or planning to focus on niche domains such as green shipbuilding, automation, marine electronics, or digital simulation can feature their expertise prominently, attracting targeted partnerships and investments.

7.9 Benefits for industry workforce

- Access to verified training opportunities: Workers can explore training programs across various shipbuilding and repair domains through the Training & certification module.
- Skill enhancement: Information about specialized skill-building courses (e.g., welding, automation, ship design) will help workers upgrade themselves for emerging job roles.
- Improved employability: By showcasing certified skills and training history, individuals can increase their chances of employment with shipyards and other stakeholders.

7.10 Benefits for regulatory bodies and government agencies

- Showcasing policy initiatives: Acts as a platform to highlight government efforts such as SBFAP, MAKV 2047, Maritime India Vision 2030, and new infrastructure projects to a wider stakeholder base.
- Targeted policy interventions: Aggregated insights from stakeholder data and Capability Assessment Frameworks (CAF) can help identify capacity gaps and direct government support effectively.

- Real-time stakeholder engagement: Through the Collaboration Hub, regulators can share official updates, participate in moderated discussions, and gather structured feedback from industry participants.
- Centralized industry visibility: Access to up-to-date data on shipyards, design agencies, repair facilities, and ancillary industries across India for informed decision-making and policy planning.
- Support for digital governance: The portal can promote transparency, traceability, and digital record-keeping, reducing paperwork and enhancing regulatory efficiency.

7.11 Benefits for classification societies

- Enhanced industry engagement: Classification societies can participate in collaborative discussions, expert panels, and Q&A forums to clarify regulations, address queries, and provide expert input on compliance matters.
- Centralized compliance visibility: The portal's Regulatory & compliance module can serve as a single-window reference point for national and international compliance guidelines, allowing classification societies to update stakeholders on evolving norms.
- Technical collaboration and advisory: Through the Innovation centre and Collaboration hub, classification societies can engage in early design evaluations, R&D discussions, and formulation of green technology standards with shipyards and design agencies.
- Digital certification support: Classification bodies can share lists of approved technologies, certified yards, and recognized training programs, supporting a transparent ecosystem for verifying compliance and certification pathways.
- Support in workforce skill alignment: Societies can interact with training institutes via the Training & certification module to advise on evolving skill requirements and help align curricula with international compliance standards.
- Early access to design and construction data: Through the project showcase of Capability insights modules, classification societies can monitor ongoing and upcoming projects, allowing for better planning of surveys and reducing lead time for certification processes.
- Analytics-driven monitoring: Access to analytics dashboards can help classification societies assess trends in compliance, recurring technical issues, and regional gaps in certification coverage, enabling proactive policy recommendations.

7.12 Benefits for shipping companies

- Visibility into shipyard and repair capabilities: Shipping companies can access detailed shipyard profiles, including dry dock availability, repair timelines, facilities, and turnaround efficiency, allowing better selection and planning for maintenance and retrofits.
- Repair planning and vendor discovery: A searchable industry directory and project showcase enable identification of suitable repair yards and ancillary service providers for sailing repairs or onboard retrofits during port calls or yard visits; based on vessel type, repair history, and location.
- Cost benchmarking and project insights: Through detailed yard profiles, shipowners can evaluate comparative performance indicators (e.g., repair duration, service quality) across facilities and regions, supporting better decision-making.
- Engagement in regulatory and innovation discussions: Participation in collaboration forums allows shipping companies to provide inputs on retrofit regulations, green compliance, and technology trends impacting their fleets.
- Insurance and financing facilitation: Information on financial products and insurance options related to shipbuilding, repairs, or green retrofits helps in cost optimization and smoother project execution.

7.13 Benefits for ports

- Visibility of infrastructure and connectivity: Ports can publish their facilities, connectivity, and marine service offerings on the portal to engage shipyards, shipping lines, and repair agencies as potential users or partners.
- Promotion of ship repair and retrofit capabilities: Ports with repair zones or allied infrastructure (e.g., floating docks, cranage, berths) can attract more maritime traffic by highlighting these facilities within the project showcase and capability modules.
- Collaboration on coastal logistics and infrastructure planning: Participation in discussions with shipyards, infrastructure firms, and DGS helps ports align development plans with upcoming vessel trends and repair demands.
- Integration into green shipping and sustainability initiatives: Ports involved in shore power provisioning, LNG bunkering, or green logistics can collaborate through the innovation module to share best practices and co-create sustainable solutions.

7.14 Benefits for ship model test facilities and other testing labs

- Increased visibility and service awareness: Testing facilities can publish their capabilities such as model basin testing, cavitation tunnels, fatigue testing, or vibration analysis - through detailed profiles, making them discoverable by shipyards and design agencies.
- Integration into project development cycles: By collaborating with design agencies and shipyards via the portal's collaboration hub, these facilities can be involved early in the design or retrofitting process, improving testing lead times and result utilization.
- Standardization and certification alignment: Being part of regulatory and technical discussions ensures that the testing parameters offered align with IMO, and classification society standards.
- Opportunities for R&D collaboration: These facilities can participate in innovation initiatives or joint research with academia and shipyards, particularly for green technologies or hydrodynamic optimization.

7.15 Benefits for shipbuilding / marine infrastructure development agencies

- Discovery of upcoming industry requirements: Access to stakeholder feedback, industry challenges, and upcoming projects allows infrastructure agencies to tailor development proposals—like dry docks, jetties, ship lifts, and coastal cluster planning.
- Collaboration with ports and shipyards: The portal facilitates partnerships with public and private ports, shipyards, and maritime boards for joint infrastructure projects or policy alignment.
- Investment facilitation: Visibility on financial and policy schemes available for shipyard/marine infrastructure under the Finance & insurance module enables structured project funding and incentivization.
- Contribution to sustainability goals: Infrastructure developers can collaborate on green port infrastructure and sustainable shipbuilding facilities through the innovation centre.

7.16 Benefits for shipyard machinery suppliers

- Lead generation through digital marketplace visibility: Suppliers of cranes, CNC equipment, steel cutting lines, welding stations, or other shipyard machinery systems can list their product offerings in stakeholder profiles, gaining exposure to a focused buyer base.

- Targeted business development: Using the portal's filters and project showcase, machinery suppliers can identify which yards are expanding, modernizing, or building capacity - allowing timely business outreach.
- Collaboration in modernization projects: The collaboration hub allows vendors to interact with shipyards on requirements, or technical fitment, particularly in relation to automation or green shipbuilding upgrades.
- Product awareness and technical content: Suppliers can upload brochures, case studies, or demonstration videos in their detailed profiles and/or technical library sections to support procurement decisions and educate shipyards on technology trends.
- Feedback-driven product evolution: Through discussions on user experience, suppliers can gather inputs from shipyards and evolve their offerings accordingly.

8. Project execution strategy

8. Project execution strategy

The development of the portal requires a structured and phased approach to ensure its successful implementation. The execution strategy is designed to systematically collect industry requirements, define functional specifications, onboard a qualified vendor, and oversee the development and deployment of the portal. This will ensure that the portal is developed in a structured, stakeholder-driven manner.

The project will be implemented in four key phases, each focusing on specific objectives and milestones to ensure efficiency, transparency, and stakeholder engagement.

By following this phased approach, the project will:

- Ensure industry-wide adoption by involving stakeholders from inception.
- Minimize operational risks through structured SI selection and quality control.
- Support future scalability by incorporating flexibility for advanced features and upgrades.

Following are the five phases of portal development:

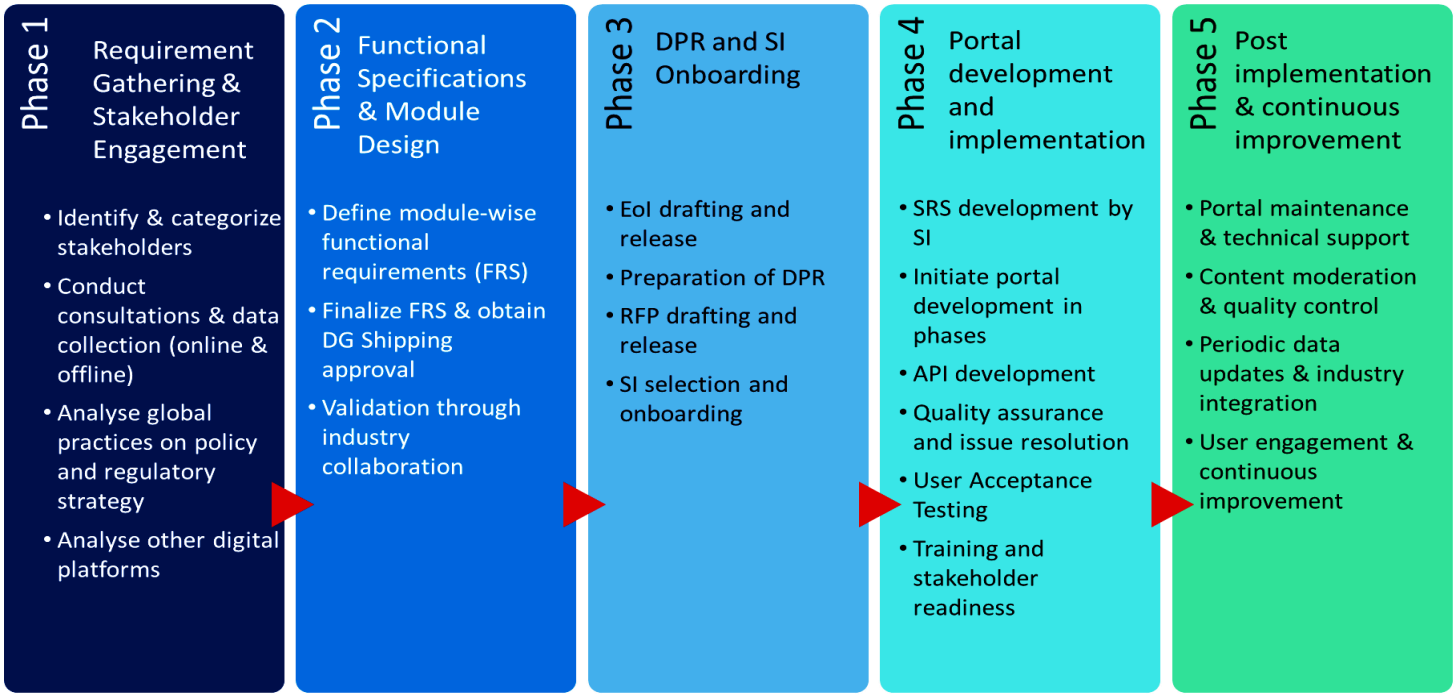

Phase 1
Requirement Gathering & Stakeholder Engagement
• Identify & categorize stakeholders
• Conduct consultations & data collection (online & offline)
• Analyse global practices on policy and regulatory strategy
• Analyse other digital platforms
Phase 2
Functional Specifications & Module Design
• Define module-wise functional requirements (FRS)
• Finalize FRS & obtain DG Shipping approval
• Validation through industry collaboration
Phase 3
DPR and SI Onboarding
• EoI drafting and release
• Preparation of DPR
• RFP drafting and release
• SI selection and onboarding
Phase 4
Portal development and implementation
• SRS development by SI
• Initiate portal development in phases
• API development
• Quality assurance and issue resolution
• User Acceptance Testing
• Training and stakeholder readiness
Phase 5
Post implementation & continuous improvement
• Portal maintenance & technical support
• Content moderation & quality control
• Periodic data updates & industry integration
• User engagement & continuous improvement

Figure 6 Phases for Portal development

8.1 Phase 1: Requirement gathering and stakeholder engagement

This phase lays the foundation for the Comprehensive Shipbuilding and Ship Repair Portal by identifying industry challenges, defining user requirements, and engaging with key stakeholders.

A data-driven approach will be used to ensure that the portal is designed to address the specific needs of the shipbuilding and ship repair industry while incorporating global best practices.

8.1.1 Key activities:

- Stakeholder identification: Identify and categorize stakeholders, including shipyards, ancillary industries, regulators, classification societies, R&D centres, financial institutions, training institutes, investors etc.
- Analysis of global practices: Analyse global practices on policy and regulatory strategy in leading shipbuilding nations (China, South Korea, Japan).
- Analysis of global digital platforms: Analyse other digital platforms in shipbuilding sector globally, providing similar functionalities as envisaged for the Portal.

8.1.2 Execution approach:

- Development of standardized questionnaires: Prepare structured questionnaires for data collection from shipyards, ancillary industries and other relevant stakeholders.
- Preparation of Project Strategy Document: Develop a detailed execution plan outlining activities to be undertaken for successful portal development.
- Ground-level data collection through IRS personnel: DGS to coordinate with IRS to deploy personnel at key coastal locations to conduct field surveys and gather first-hand industry insights.
- Validation of data: Ensure data accuracy through direct stakeholder interviews and document analysis.

8.1.3 Expected outcomes of Phase 1:

- A comprehensive Project Strategy Document outlining the execution plan for portal development.
- Validated stakeholder inputs, forming the basis for defining functional specifications in the next phase.

8.2 Phase 2: Preliminary functional requirements and module design

In this phase, the collected requirements and information will be translated into preliminary functional specifications, defining the portal's structure and workflow components. This phase ensures that each module aligns with industry needs and integrates seamlessly with existing government initiatives.

8.2.1 Key activities:

- Define requirements for each portal module:
  - Capability Insights Module: Standardizing shipyard and other stakeholder profiles and project listing formats.
  - Collaboration Hub Module: Creating forums, discussion boards, and networking features.
  - Training & Certification Module: Showcasing available training programs, certifications, and skill development courses, along with profiles of training institutes and course details for industry professionals to enable them to train and upskill themselves.
  - Finance & Insurance Module: Information of available financing options, government incentives programs and insurance products for shipbuilding and repair sector in India.
  - Innovation Centre Module: Enabling research collaborations, providing information on R&D projects, green technologies, emerging shipbuilding technologies, and other sustainability initiatives.
  - Technical Library: Structuring document access and knowledge-sharing functionalities.
  - Regulatory Compliance Module: Providing information on regulatory requirements, industry standards, and compliance guidelines for easy access by stakeholders.
  - Industry Directory Module: Establishing an organized listing of shipyards, suppliers, and other stakeholders.
- Functional design:
  - Define system architecture requirements, user access levels, and data security protocols.
  - Outline integration strategies with existing DG Shipping databases and other industry platforms (as applicable).
- Validation through industry collaboration:

- Conduct discussions/workshops with relevant industry stakeholders to validate and refine specifications, as required.

8.2.2 Execution approach:

- Structured requirement analysis: Organize and analyse collected data to define the functional needs of each module, ensuring alignment with industry best practices.
- Module-specific specification development: Prepare preliminary functional specifications for key modules, mentioned above.
- Stakeholder consultations and validation: Conduct discussions/workshops with relevant stakeholders.
- Integration framework development: Establish data exchange mechanisms to integrate with DG Shipping databases and other maritime platforms where applicable.

8.2.3 Expected outcomes of Phase 2:

- Preliminary functional requirements detailing the tentative workflow structure requirements of the portal.
- Clearly defined system architecture, outlining data security measures, user roles, and integration protocols.
- Refined module-specific requirements based on stakeholder feedback and industry validation.
- Standardized formats for shipyard profiles, project listings, and financial assistance information, ensuring uniform data representation across the portal.
- Validated integration strategy for connecting the portal with DG Shipping databases and other relevant platforms.

8.3 Phase 3: Detailed Project Report and System Integrator onboarding

This phase involves preparing a Detailed Project Report (DPR) for vendor participation. The DPR will provide a clear roadmap for implementation, including cost estimates, execution timelines, and other relevant details.

8.3.1 Key activities:

- Expression of Interest (EoI) drafting and release:
    - Prepare an EoI document to invite proposals from interested vendors, seeking their participation in the development of the portal.
    - Vendor outreach and market assessment: Conduct industry engagement activities to ensure wide participation from qualified vendors and gather insights on available technical expertise.
    - Preliminary evaluation of responses: Assess submitted EoIs to identify potential vendors who meet the basic eligibility and capability criteria for the portal's development.
- Preparation of the Detailed Project Report (DPR):
    - Consolidate findings from Phases 1 and 2 into a structured DPR.
    - Include financial projections, and implementation timelines.
- RFP drafting and release:
    - Develop a Request for Proposal (RFP) document specifying functional requirements for portal development.
    - Define vendor evaluation criteria, ensuring compliance with DG Shipping procurement standards.
- Vendor selection and onboarding:
    - Conduct pre-bid meetings to clarify RFP expectations with prospective vendors.
    - Evaluate vendor proposals based on technical capability, experience, and cost-effectiveness.
    - Finalize contract terms, ensuring strict Service Level Agreements (SLAs) and milestone-based deliverables.

8.3.2 Execution approach:

- Structured compilation of DPR: Organize findings from Phases 1 and 2 into a comprehensive DPR, detailing functional requirements, cost estimates, and implementation timelines.
- Stakeholder validation of DPR: Coordinate with DG Shipping to review and approve the DPR's scope, financial projections, and functional specifications before proceeding with vendor selection.

- Targeted vendor outreach: Conduct consultations to identify potential vendors, ensuring broad participation and competitive bidding.
- Transparent EoI process: Develop and release an Expression of Interest (EoI) to attract qualified vendors, followed by preliminary evaluation of submitted responses.
- Comprehensive RFP drafting: Prepare a detailed RFP with well-defined functional specifications, ensuring alignment with DGS procurement policies.
- Pre-bid engagement and clarifications: Organize pre-bid meetings to address vendor queries and ensure clarity on project expectations.
- Objective vendor selection process: Evaluate vendor proposals based on technical expertise, compliance with functional requirements, past experience, and cost competitiveness.
- Milestone-based vendor onboarding: Finalize contracts with clear SLAs, phased deliverables, and accountability mechanisms to ensure timely and high-quality portal development.

8.3.3 Expected outcomes of Phase 3:

- Comprehensive Detailed Project Report (DPR) finalized, incorporating findings from stakeholder consultations, industry analysis, financial projections, and implementation timelines.
- EoI process completed, leading to a shortlist of qualified vendors with demonstrated technical expertise.
- Request for Proposal (RFP) successfully drafted and released, outlining clear functional, and procurement requirements.
- Pre-bid meetings conducted, ensuring clarity of expectations and addressing vendor queries before proposal submission.
- Transparent and competitive vendor selection process executed, ensuring the appointment of a technically competent and cost-effective system integrator (SI).
- Signed vendor contract with well-defined SLAs, milestones, and deliverables, ensuring timely and high-quality development of the portal.

8.4 Phase 4: Portal development and implementation

This phase ensures a smooth transition, user onboarding, and ongoing enhancements based on industry feedback. KPMG will be responsible for overseeing the development, testing, and deployment of the portal by the System Integrator (SI). As part of the Project Management and Control Committee (PMCC), KPMG ensures that the SI delivers a final product that meets all functional requirements.

8.4.1 Key activities (KPMG shall oversee portal development by the SI):

- Monitoring of portal development and module implementation:
  - SI to develop well defined FRS and SRS for the portal development
  - SI to initiate portal development.
  - SI to integrate with existing maritime databases and external APIs (SBFAP portal, e-Samudra portal, MoPSW portal etc.).
- Quality assurance and issue resolution:
  - SI to conduct internal testing at each development stage to ensure compliance with specifications.
  - SI to implement User Acceptance Testing (UAT) with shipyards, regulatory bodies and other stakeholders (as required) to gather feedback.
  - SI to establish an issue resolution protocol to address technical challenges.
- Training and stakeholder readiness:
  - SI to develop user manuals, training sessions, and FAQs to familiarize stakeholders with portal functionalities.
  - SI to provide hands-on training for shipyard personnel, financial institutions, and regulators.
- Final Go-Live and post-launch monitoring:
  - SI to develop required documentation for the portal such as “Terms of Use” and “Privacy Policy” etc.
  - SI to deploy the portal, starting with a pilot launch.
  - SI to monitor portal performance and resolve initial operational issues.

8.4.2 Execution approach:

- Agile development model: SI to adopt iterative development cycles for quick adjustments.
- Feedback-driven refinements: SI to incorporate user feedback into post-launch upgrades.

8.4.3 Outcome of Phase 4:

- Fully functional portal deployed and integrated with key stakeholders.
- Trained/informed users, ensuring adoption and seamless operational transition.
- Post-deployment monitoring framework established for continuous improvements.

8.5 Phase 5: Post implementation & continuous improvement

Once the Portal is fully developed and deployed, a structured post-implementation strategy will be required to ensure sustained functionality, user engagement, data accuracy, and continuous enhancements. This phase will focus on maintenance, monitoring, stakeholder support, and long-term scalability, ensuring the portal remains relevant, efficient, and aligned with industry advancements.

8.5.1 Key Activities

1. Portal maintenance & technical support

- The System Integrator (SI) will provide ongoing technical support for resolving system issues, software bugs, and performance optimization.
- Implementation of regular security patches, updates, and vulnerability assessments to ensure compliance with cybersecurity standards.
- Database management & backup protocols to protect critical industry data and maintain system reliability.
- Retention of dedicated SI personnel for troubleshooting, ensuring prompt response to technical queries and operational disruptions.

2. Content moderation & quality control

- IRS-deployed site personnel (whose on-ground roles will conclude post-implementation) may be retained by DG Shipping for content moderation and stakeholder data verification. Alternatively, DGS may employ additional resources through SI or other external agency for the same.

- Establishment of verification workflows to review stakeholder-submitted data before publishing on the portal.
- Implementation of content accuracy checks, ensuring technical resources, industry reports, and regulatory updates remain current and valid.
- Periodic audits to evaluate stakeholder contributions, flagging outdated or misleading information.

3. Periodic data updates & industry integration

- Continuous onboarding of new stakeholders (shipyards, design agencies, investors, ancillary industries, training institutions, financial entities etc.) to keep the platform dynamic and reflective of industry changes.
- Integration of latest government schemes, regulatory policies, and financing programs to provide updated industry intelligence.
- Establishment of API linkages with other portals for seamless data synchronization.
- Regular updates to modules such as Capability Insights module, Training & Certification module, Finance & Insurance module etc. to ensure fresh and reliable industry data.

4. User engagement & continuous improvement

- Organizing periodic training sessions and webinars to ensure that stakeholders effectively utilize portal functionalities.
- Industry feedback mechanisms (surveys, discussion forums, and direct stakeholder inputs) to assess portal usability and identify areas for enhancement.
- Annual performance reviews and system analytics to track engagement levels, module effectiveness, and user adoption rates.
- Rolling out new features and enhancements based on industry trends, emerging technologies, and stakeholder recommendations.

8.5.2 Expected outcomes of Phase 5

- Sustained operational efficiency through dedicated maintenance, support, and security updates.
- Enhanced industry engagement via moderated content, updated data, and interactive learning opportunities.

- Continuous evolution of portal functionalities, ensuring long-term relevance and adoption by industry stakeholders.
- Scalability provisions to integrate future technological advancements (AI-driven analytics, predictive maintenance tools, blockchain etc.).

8.6 Proposed timelines

The execution of the Portal will follow a structured timeline to ensure timely development, testing, and deployment. Each phase of the project has been planned with clear deliverables and milestone tracking, ensuring that the portal is developed efficiently while incorporating stakeholder feedback and industry best practices. The overall project timeline is estimated to be 12 months which is divided into five key phases detailed in previous sections.

Milestone tracking and monitoring

To ensure accountability and adherence to deadlines, a Project Monitoring and Control Committee (PMCC) will be established, including DGS officials and KPMG team to:

- Conduct periodic project reviews to monitor progress and address roadblocks.
- Ensure that project deliverables align with DPR, government policies and maritime development goals.
- Provide strategic direction on future enhancements and policy integration.

Dependencies for project timelines

The proposed 12-month timeline provides a structured roadmap for executing the Portal. By adopting a phased approach, the project ensures efficient stakeholder engagement, vendor selection, quality control, and post-launch improvements.

The proposed timeline assumes that all key dependencies are met within the planned schedule. However, the overall project timeline is contingent upon multiple external factors that are beyond the direct control of the KPMG team.

Key dependencies include:

- Deployment of competent site resources by DG Shipping and IRS: Timely mobilization of IRS personnel for ground-level data collection from shipyards, repair facilities, and coastal locations is critical to ensuring accurate and comprehensive industry insights. Any delays in resource deployment may extend the requirement gathering phase.

- Timely information sharing by stakeholders: The portal's functional design is highly dependent on receiving timely and accurate data from shipyards, training institutes, regulatory bodies, financial institutions and other relevant stakeholders. Any delays in stakeholder responses will impact the overall timelines for the project.
- Vendor selection and onboarding by DG Shipping: The execution of portal development is contingent on DG Shipping finalizing the vendor selection process and onboarding the system integrator within the planned timeframe. Delays in issuing the RFP, evaluating bids, or completing the contract negotiation process will directly impact the project timelines.
- Completion of Portal development by the SI: The system integrator will be responsible for adhering to the agreed development schedule, meeting quality standards, and resolving technical issues. Any setbacks in development, testing, or integration could lead to an extended implementation phase.

In case of delays in any of the above dependencies, the overall project schedule may be extended accordingly, impacting subsequent phases of execution. It is recommended that all involved stakeholders adhere to a structured coordination mechanism to minimize delays and ensure the successful and timely completion of the portal.

8.7 Support required from DG Shipping

The successful execution of the Portal requires active collaboration between the KPMG team, DG Shipping, and other industry stakeholders. As the nodal agency overseeing the project, DG Shipping's involvement is critical in ensuring that all stakeholders actively participate, regulatory frameworks are adhered to, and implementation challenges are promptly addressed.

The Portal is expected to serve as a digital backbone for the shipbuilding and repair industry, integrating government policies, regulatory requirements, industry data, and financial assistance programs. Given this multi-stakeholder nature, the KPMG team will require ongoing support from DG Shipping in the following key areas:

8.7.1 Facilitate stakeholder access for consultations and data collection

To ensure that the portal meets the needs of all industry players, it is essential to engage shipyards, financial institutions, research bodies, classification societies, ancillary service providers and other industry stakeholders. However, many of these stakeholders may be reluctant or slow to share critical data without formal direction from DG Shipping.

Specific support required from DG Shipping:

- Issuance of official communications: DG Shipping should issue formal letters or circulars directing public and private shipyards, training institutions, regulatory bodies and other industry stakeholders to participate in the consultation process.
- Facilitate direct engagement: Support in organizing stakeholder meetings, consultations, and site visits by IRS site teams to ensure smooth data collection.
- Endorsement for industry-wide participation: Encouraging active involvement from stakeholders by emphasizing the portal's long-term benefits.
- Authorize IRS personnel for ground surveys: DG Shipping to issue required directives authorizing IRS personnel to collect data from shipyards, training centres, repair docks and other industry stakeholders across the coastline.

Expected impact:

- Ensures full participation from all relevant stakeholders.
- Improves data accuracy and completeness for the portal's functional specifications.
- Helps in standardizing industry-wide reporting formats for shipyards and repair facilities.

8.7.2 Provide timely feedback on preliminary functional requirements, EOI, RFP and DPR documents

For the Portal to be aligned with industry needs and regulatory frameworks, DG Shipping's review and approval of key project documents is essential.

Specific support required from DG Shipping:

- Preliminary functional requirements of Portal and regulatory integration:
  - Review and validate the proposed features of the portal.
  - Guide on the required seamless integration with existing DG Shipping databases and regulatory frameworks.
- Validation of Expression of Interest (EOI) and Request for Proposal (RFP):
  - DG Shipping should provide input on selection criteria, and contractual terms for the vendor selection process.
  - Ensure that the EOI and RFP documents comply with procurement guidelines, government policies and IT security protocols.
- Review and approval of the Detailed Project Report (DPR):

- DG Shipping should evaluate and approve the DPR's scope and financial estimates before vendor onboarding.
- Provide guidance on policy alignments, ensuring that the portal complements MIV 2030 and MAKV 2047.

Expected impact:

- Speeds up approvals, ensuring project timelines are met.
- Improves alignment with government policies and maritime development plans.
- Reduces risks of post-implementation gaps or non-compliance issues.

8.7.3 Support for vendor onboarding

The portal development process requires the onboarding of a qualified system integrator (SI) to execute the technical implementation.

Specific support required from DG Shipping:

- Guidance in vendor selection and contracting:
  - DG Shipping should participate in vendor selection evaluations, ensuring the selected vendor has the necessary technical expertise and requisite experience.
  - Provide insights into data security, compliance, and procurement policies during contract finalization.

Expected impact:

- Ensures smooth onboarding and compliance of the selected vendor.
- Provides accurate, real-world industry data for shipyard profiles and benchmarking.
- Strengthens portal's data integration capabilities, improving usability for stakeholders.

8.7.4 Establishing an oversight and monitoring mechanism

For effective execution, DG Shipping should establish a Project Monitoring and Control Committee (PMCC), including DGS officials and KPMG team members to oversee progress, resolve bottlenecks, and ensure accountability.

Roles of the PMCC:

- Conduct periodic project reviews to monitor progress and address roadblocks.
- Ensure that project deliverables align with DPR, government policies and maritime development goals.

- Provide strategic direction on future enhancements and policy integration.

DG Shipping's active involvement and timely support are essential for ensuring the successful implementation of the portal. By facilitating stakeholder coordination, providing feedback & approvals, and supporting vendor onboarding, DG Shipping will help in completing the development of portal in time.

9. Stakeholder identification and engagement plan

9. Stakeholder identification and engagement plan

The successful development and adoption of the portal depend on active participation from a wide range of stakeholders across the Indian shipbuilding and repair ecosystem. Effective stakeholder engagement ensures that the portal successfully showcases stakeholder capabilities, facilitates collaboration, and provides relevant data-driven insights.

This chapter outlines the approach for stakeholder identification, categorization, and engagement strategies, ensuring inclusivity and seamless coordination throughout the project lifecycle.

9.1 Objectives of stakeholder engagement

The primary objectives of stakeholder engagement are:

- Comprehensive representation – To include all relevant stakeholders contributing to Indian shipbuilding and ship repair industry.
- Industry alignment – To ensure the portal's functionalities align with the needs of the shipbuilding ecosystem.
- Collaboration & data sharing – To facilitate active cooperation and knowledge-sharing among key industry players.
- Policy & regulatory compliance – To involve government and regulatory authorities for policy alignment and oversight.
- Sustainability & long-term usage – To establish long-term engagement mechanisms to keep the portal relevant and updated.

9.2 Stakeholder categories and sub-categories

To ensure organized engagement, stakeholders have been categorized into major groups, with sub-categories for better classification. Some of these major groups and their sub-categories are as follows:

9.2.1 Shipbuilding & ship repair industry

- Public sector shipyards - government-owned shipyards involved in commercial, defence, and specialized shipbuilding.
- Private sector shipyards – Private and joint venture shipyards engaged in shipbuilding and repair activities.

- Ship repair yards – Standalone ship repair yards specializing in maintenance, retrofitting, and repair of vessels.

9.2.2 Government & regulatory bodies

- Ministry of Ports, Shipping & Waterways (MoPSW) – The nodal ministry responsible for maritime development in India.
- Directorate General of Shipping (DGS) – The key regulatory body overseeing maritime safety, ship registration, and industry standards.
- State maritime boards – Regional authorities managing maritime infrastructure, ports, and shipyards at state level.
- Classification Societies – Indian and international classification bodies providing vessel certification and compliance services.

9.2.3 Industry associations & trade bodies

- Shipyard Association of India (SAI) – Industry body representing shipyards in India.
- Indian National Shipowners' Association (INSA) – Representative body of Indian shipping companies.
- Federation of Indian Chambers of Commerce & Industry (FICCI) – Maritime Committee – Engaging in policy advocacy and industry promotion.
- Indian Marine Design Agencies (IMDA) – A network of ship design agencies working in India.

9.2.4 Design & R&D agencies

- Design Agencies – Ship design agencies working in India.
- R&D institutions – Institutes involved in naval architecture, marine engineering, and ship technology research.

9.2.5 Ancillary & marine equipment industry

- Shipbuilding raw material suppliers – Steel, composites, and advanced material providers.
- Marine equipment manufacturers – Suppliers of propulsion systems, navigation, automation, and shipboard electronics.
- Industrial service providers – Firms offering fabrication, coating, welding, and assembly services to shipyards.

9.2.6 Training & skill development institutes

- Indian Maritime University (IMU) & other colleges – Providing specialized courses in shipbuilding and repair industry.
- Technical & vocational training institutes – ITIs, polytechnics, and private training providers specializing in shipyard workforce training.
- In-House training institutes of shipyards – Shipyard-run training centres offering skill development programs.

9.2.7 Ports & maritime infrastructure developers

- Major ports & private ports – Port authorities / operators facilitating shipbuilding and repair activities.
- Infrastructure development companies – Firms involved in shipyard modernization, dry dock construction, and related maritime infrastructure.

9.2.8 Financial & investment stakeholders

- Financial institutions & banks – Providers of loans, credit facilities, and financing schemes for shipbuilding projects.
- Investors & private equity firms – Entities seeking opportunities in the Indian maritime sector.

9.3 Stakeholder engagement strategy

The portal's business model is built on the foundation of driving inclusive digital transformation across the entire shipbuilding, ship repair, and ship recycling ecosystem by addressing the specific needs of each stakeholder group through a structured, stakeholder-first approach. Using the "5 Ws and 1 H" framework, the design begins with identifying **Who** the stakeholders are—shipyards (public and private), repair facilities, classification societies, training institutes, regulators, technology providers, investors, and workforce participants. **What** the portal offers includes access to real-time data, capability maps, digital collaboration tools, policy frameworks, funding schemes, and skilling programs. **When** these stakeholders engage with the portal spans the entire lifecycle of maritime operations—from planning and design to execution, certification, and capacity enhancement. **Where** stakeholders interact with the portal is through a centralized digital platform accessible across geographies, ensuring nationwide representation and regional equity. **Why** this is essential lies in the current fragmentation and data asymmetry in the SBR sector, which limits efficiency, transparency, and growth. Finally, **How** the portal will deliver value is through modular services, data-driven insights, API-based system integration with existing

platforms, multilingual access, and periodic feedback loops to adapt to evolving user needs. This framework ensures that the portal's business model is robust, inclusive, and capable of delivering tailored digital services that meet the diverse expectations of the maritime community.

Element	Description	
Who	Stakeholders served by the portal:	
	• Shipyards (public/private)	• Skill Development Agencies
	• Classification Societies	• Financial Institutions and Insurance Providers
	• Industry Associations and Trade Bodies	• Shipping Companies
	• Government Bodies and Regulatory Authorities	• Ports
	• Ancillary (Product Suppliers + Service Providers)	• Ship Model Test Facilities and other testing facilities and Laboratories
	• Research and Development (R&D) organization and Academic Institutions	• Shipbuilding / Marine Infrastructure Agencies
	• Ship Design Agencies	• Shipyard Machinery Suppliers
What	Services and features offered:	
	• Digital industry repository	
	• Real-time dashboards & analytics	
	• Central collaboration platform	
	• Financial schemes & investment info	
	• Training and certification listings	
	• Regulatory updates & compliance tools	
	• Sustainability & innovation enablers	
When	Key moments of portal use:	
	• During project planning/investments	
	• While onboarding vendors/partners	
	• For workforce skill development information	
	• During regulatory or scheme updates	
	• In policy change or emergency response	
Where	Access and interaction channels:	
	• Global-level online platform	
	• Integrated with regional clusters	
	• Web and mobile accessibility	
	• Login for agencies/stakeholders	
Why	Strategic importance:	
	• Bridge data gaps & fragmentation	
	• Drive competitiveness & visibility	
	• Enable evidence-based policy & decisions	
	• Strengthen sectoral self-reliance	
	• Align with MIV 2030 & MAKV 2047 goals	

How	Delivery and implementation:
	• Modular, scalable architecture
	• Role-based access for users
	• API integration with govt/industry systems
	• Multilingual, user-friendly interface
	• Secure, feedback-driven design

A definite approach with following engagement phases will be followed to ensure maximum stakeholder participation and effective collaboration.

9.3.1 Stakeholder mapping & prioritization

- Identifying key stakeholders based on their role in the shipbuilding and ship repair industry.
- Prioritizing engagement based on criticality for portal project execution.

9.3.2 Initial consultations & awareness sessions

- Conducting introductory meetings and presentations to inform stakeholders about the portal objectives and benefits.
- Addressing initial concerns and gathering preliminary feedback.

9.3.3 Detailed data collection & requirement gathering

- Engaging stakeholders through structured questionnaires to collect data.
- Follow ups with stakeholders through IRS deployed personnel and virtual meetings for focus group discussions.

9.3.4 Collaboration for functional design & validation during execution

- Engaging industry representatives in defining portal functionalities.
- Conducting working group sessions to validate module specifications through SI.

9.3.5 Onboarding & training

- Assisting stakeholders in registering on the portal.
- Providing training on portal usage, data submission, and industry collaboration features through SI.

9.3.6 Long-term collaboration & governance

- Establishing a structured feedback mechanism through SI to continuously improve the portal.

- Defining governance frameworks for data validation, content moderation, and periodic updates.

9.4 Expected outcomes

- Comprehensive industry representation – Ensuring that all key maritime stakeholders are involved in the portal.
- Accurate & verified data – Capturing real-time industry data for shipbuilding capacity, investments, regulations, and infrastructure.
- Enhanced industry collaboration – Creating an integrated platform for knowledge exchange and business networking.
- Improved policy formulation – Facilitating data-driven decision-making for regulators and policymakers.
- Sustainable engagement model – Ensuring long-term participation and industry-wide adoption of the portal.

10. Data collection and analysis for portal

10. Data collection and analysis for portal

The successful development of the portal largely depends on accurate, structured, and verified data collection from relevant industry stakeholders. This data collection and analysis process is a critical phase in portal development, laying the groundwork for an authentic, stakeholder-driven digital ecosystem. The final stakeholder list, categorized in the previous chapter, forms the foundation for this data collection exercise.

A systematic data-collection approach will be adopted, leveraging both online and offline modes to ensure comprehensive coverage. The collected data will be analyzed, validated, and utilized to populate various sections of the portal while also developing the final capability assessment framework (CAF) for selected stakeholders. The combination of online data submission, IRS-assisted field surveys, and rigorous verification protocols will ensure that the collected data is comprehensive, accurate, and actionable.

By following this structured approach, the portal will serve as a credible and dynamic repository, fostering industry collaboration, knowledge-sharing, and informed policymaking for India's shipbuilding sector.

Additionally, insights derived from this process will aid in developing a structured digital repository, facilitating industry-wide showcasing & knowledge-sharing and informed decision-making for stakeholders and policymakers.

10.1 Strategy for data gathering from stakeholders

The data collection process will involve a multi-pronged approach, ensuring that information is obtained efficiently while maintaining data integrity and accuracy.

10.1.1 Modes of data collection

1. Online mode (Primary collection method)
    - Stakeholders will be provided with structured digital questionnaires, customized as per their industry role (e.g., shipyards, ancillary industries, financial institutions, regulatory bodies, etc.).
    - Where available, associations of various stakeholders will be reached out for coordination and follow up with their individual members on data collection exercise.
2. Offline mode (Supplementary collection method)

- IRS field personnel will be deployed by DGS at key coastal locations to conduct on-site assessments, stakeholder consultations and data collection.
- Industry meetings, industry conferences, and DGS officials' site visits will be leveraged to gather additional qualitative insights.
- Follow-ups through physical document collection where required for verification purposes.

10.1.2 Key considerations for effective data collection

- Comprehensive coverage: Stakeholder-specific questionnaires will ensure that all relevant data points are captured without redundancy.
- Verification & approvals: Collection of confidential data will be avoided and approval from the individual stakeholders will be sought before showcasing any collected data on the portal. The collected data will be verified through requisite documents (collected from individual stakeholders) and DGS.
- Standardization: Consistent data formats will be maintained across stakeholders for seamless integration into the portal.
- Duplication avoidance: A centralized repository will be created through DGS to eliminate redundant data requests in future interactions.
- Confidentiality & security: Measures will be adopted to safeguard proprietary and sensitive industry data.

10.2 Data points to be collected from stakeholders

The data collection exercise will cover a broad spectrum of industry parameters, ensuring that the portal reflects an accurate and up-to-date snapshot of India's shipbuilding ecosystem.

10.2.1 Data categories based on stakeholder type

The data collection will be tentatively structured according to stakeholder groups as follows:

Stakeholder category	Key data points to be collected
Shipyards (Public & Private)	Production capacity, dry dock/facility details, vessel types built, repair capabilities, workforce skills, technology adoption, regulatory compliance, financial status, expansion plans.
Ship repair yards	Types of vessels serviced, repair turnaround time, major repair services, floating dock/slipway details, certifications, workforce availability, equipment inventory.

Stakeholder category	Key data points to be collected
Ancillary industries	Products supplied, raw material processing capacity, supplier network, major shipyard clients, compliance certifications.
Design agencies	Standard vessel designs developed, simulation and modelling capabilities, classification approvals, digital design tools used.
Financial institutions	Investment in shipbuilding projects, loan and credit schemes, participation in government subsidy programs.
Regulators & government bodies	Maritime policies, shipbuilding incentives, environmental compliance frameworks, future industry roadmaps (as available).
Training institutes & skill development centres	Courses offered, student intake, industry tie-ups, practical training infrastructure, certifications granted.
Ports & infrastructure developers	Shipbuilding-related infrastructure, repair facilities, dredging capacity, connectivity with industrial zones.

10.3 Preparation of questionnaire templates for information collection

A series of stakeholder-specific questionnaires will be developed, ensuring structured, standardized, and easy-to-fill data collection formats. These questionnaires will be tailored for different stakeholder categories, addressing their unique roles in the shipbuilding and ship repair ecosystem.

10.3.1 Key features of the questionnaires:

- Modular structure: Each questionnaire will be customized to match the stakeholder type, ensuring relevance.
- Logical flow: A well-structured format will ensure smooth navigation through different sections.
- Mandatory & optional fields: Essential data points will be marked as mandatory, while additional insights can be provided voluntarily.
- Ease of submission: Stakeholders can submit responses via the online platform (mostly through Google Forms).

10.3.2 Example of questionnaire structure (for shipyards):

- General information – Name, location, ownership type, contact details.
- Operational scope – Vessel types built / repaired, annual repair capacity.

- Infrastructure and capacity details – Area, waterfront, dry docks, slipways, floating docks, cranage, fabrication facilities etc.
- Workforce and training – manpower, skill levels, training facilities
- Technology adoption – Digitalization, automation, simulation capabilities, green technologies.
- Compliance & certifications – ISO, classification society approvals, environmental & safety regulations.
- Financial & business details – Turnover, funding sources, government incentives utilized.
- Future expansion plans – Planned infrastructure upgrades, technology adoption, market expansion goals.

Similar structured questionnaires will be created for design agencies, ancillary industries, financial institutions, training institutes, and other stakeholders ensuring uniformity in data collection.

10.4 Deployment of IRS personnel for ground-level data collection

To supplement the digital data collection process, a dedicated team of IRS field personnel will be stationed at strategic coastal locations by DGS for on-site data collection, verification and industry engagement.

Roles & responsibilities of IRS personnel:

1. Shipyard & industry engagement: Conduct field visits to shipyards, ancillary industries, and other stakeholder facilities to gather direct insights.
2. Survey administration: Facilitate the completion of structured questionnaires and collect supporting documentation.
3. Technical data validation: If required and possible, cross-check stakeholder infrastructure details, and other data points included in questionnaires.
4. Follow-up & industry liaison: Act as a bridge between industry stakeholders and the DGS/KPMG for clarifications and additional inputs.
5. Feedback mechanism: Capture industry concerns and recommendations to refine the final functional requirements from the portal.

By leveraging IRS personnel for physical assessments, higher data accuracy and reliability will be ensured, reducing the risk of misreporting or incomplete submissions.

10.5 Data analysis & application for portal development

Once collected, the data will undergo a structured analysis process to extract meaningful insights and ensure accurate representation within the portal.

10.5.1 Data processing & validation workflow:

- Data aggregation – Information will be compiled and categorized based on stakeholder type.
- Verification & cleansing – Inconsistent or duplicate data entries will be filtered out.
- Cross-referencing with existing records – Comparison with previous datasets available with DGS will be carried out for validation.
- Approval mechanism – Critical data points will be verified through regulatory bodies (DGS, IRS) before final integration into the portal.
- Integration into portal modules – Processed data will populate relevant sections of the platform.

This structured analysis will help refine the final functional specifications, ensuring that the portal is developed with industry-backed, reliable, and real-time data.

11. Implementation strategy & rollout plan for SI

11. Implementation strategy & rollout plan for SI

11.1 Phase 1: Requirement gathering

11.1.1 Detailed requirement analysis

System Integrator will develop a thorough understanding of the portal—its objectives, functionality, and user landscape in discussion with PMCC and through documents provided to the SI by DGS, including but not limited to – Concept Note, DPR etc. This step is crucial to ensure alignment with the portal's vision and operational framework.

The SI will adopt a structured methodology for showcasing stakeholder inputs on the portal, ensuring the portal is aligned with user needs and expectations. The stakeholder inputs will be provided by the PMCC to the SI. SI will conduct stakeholder sessions (about 25-30) using structured formats to capture qualitative and quantitative inputs as part of the requirement gathering.

SI will use the DPR document to integrate best features into the portal and will consult with PMCC to gain understanding on the features envisaged for the portal. Basis this understanding, SI will create detailed FRS and SRS documents containing chapters on key modules, system architecture, user workflows, and compliance standards etc.

SI will ensure sufficient checkpoints for sensitive data and the selection criteria for displayed data, which is essential for ensuring data security and compliance within the portal. The System Integrator will develop the protocols for managing, securing, and displaying information while maintaining confidentiality and accessibility. The following topics will be covered by SI after consultation with PMMC:

- Data classification (public, restricted, confidential)
- Access control mechanisms (role-based access, encryption standards)
- Regulatory compliance (GDPR, industry-specific guidelines)
- Audit and monitoring checkpoints (tracking data interactions and usage)

11.2 Phase 2: Conceptualization and Planning Phase

11.2.1 Translating DPR into detailed FRS and SRS

Translating DPR into detailed FRS and SRS is a crucial step in ensuring that the portal's development aligns with its intended functionality and user needs. A detailed discussion on portal design strategy is essential to ensure structured development that meets user needs and

industry standards. This strategy typically involves several key phases to bridge the gap between conceptual requirements and technical implementation.

An effective approach to structuring this translation process is as follows:

- Requirement analysis & mapping – Identify the functional requirements from the DPR and classify them into clear functional and software specifications, ensuring no ambiguity.
- Technical feasibility assessment – Evaluate whether each functional requirement can be implemented within the chosen technology stack and infrastructure.
- Detailed module design – Convert functional descriptions into detailed software specifications, including system architecture, data models, workflows, and API integrations.
- Validation & gap analysis – Conduct a cross-check between the DPR requirements vis-à-vis the drafted detailed FRS & SRS to ensure all functional and technical aspects are accurately covered.
- Module-based workflows breakdown – Detailed breakdown of module workflows in consultation with PMCC, covering:
    - User management & onboarding
    - User registration, verification, role assignment, and account management.
    - Integration with authentication systems for secure access.
    - Stakeholder collaboration & database creation
        - Process for stakeholder onboarding, data collection, validation, and integration into the system.
        - Workflow for interactive communication and information exchange among stakeholders.
    - PMCC review & approval – Present the FRS and SRS to PMCC, to confirm alignment with the portal's vision. Adjust and optimize the FRS and SRS based on feedback prior finalizing and get PMCC sign-off to commence the portal development.

11.2.2 Selecting the best technology for portal development

SI to ensure that the portal is planned and built on a robust technological foundation that supports scalability, innovation, and long-term viability. SI to select the right technology stack considering

current advancements, future trends, and potential disruptions. Following are the key factors to be considered by SI when choosing the best technology for portal development:

- Scalability & performance – The chosen technology should support a high volume of users and transactions while maintaining fast response times.
- Microservices architecture – modular approach to be adopted to improve flexibility, enable faster updates, and support scalability.
- Cloud-based infrastructure – MEITY approved cloud service providers to be used for portal hosting, selecting the service which ensures resilience, security, and easy scalability.
- Artificial intelligence & automation – AI-driven analytics, chatbots, and process automation to be selected to enhance the portal's efficiency and user experience.
- Security & compliance – Shortlist zero-trust security models, encryption, and role-based access to ensure data integrity and protection.
- Integration with emerging technologies – Explore integrating Artificial Intelligence, Machine Learning and other applicable emerging technologies into the portal's functionalities.
- Low-code/No-code platforms – Where applicable, these can be planned to speed up development and configure workflows easily.
- Open-source vs. proprietary solutions – Carefully weigh the advantages of open-source frameworks for flexibility versus proprietary solutions.

11.3 Phase 3: Prototype development & UI/UX finalization

Once the modules and functionalities have been clearly defined, the System Integrator will create an interface outline that prioritizes structure and functionality.

Key aspects of the interface outline creation:

- User flow & navigation – Designing how users will move through the portal, ensuring smooth interactions.
- Wireframing & layout design – Structuring visual elements while keeping the interface intuitive and user-friendly.
- Feature accessibility – Mapping out how key functionalities will be incorporated for easy access.

- Responsiveness & adaptability – Ensuring compatibility across multiple devices and screen sizes.
- Integration with backend systems – Defining how the interface will connect with core functionalities and data sources.
- Security & user role management – Implementing role-based access controls within the interface structure.
- By incorporating visual elements and aesthetics, the SI to refine the user experience (UX) to ensure seamless interaction.

Focus areas for refining UX in the wireframe:

- Consistency in design – Establishing a uniform colour scheme, typography, and iconography that aligns with the portal's branding.
- Intuitive navigation – Simplifying the interface to ensure users can easily access core functionalities without confusion.
- Responsiveness & accessibility – Ensuring the wireframe adapts to multiple devices and meets accessibility standards (WCAG compliance) for inclusivity.
- Interactivity & micro animations – Adding subtle transitions, tooltips, and animated interactions to enhance engagement.
- Optimized layout for user flow – Positioning elements strategically to guide users through key actions effectively.
- Loading performance optimization – Implementing lightweight visuals to reduce load time while maintaining aesthetic appeal.
- Feedback mechanisms – Designing clear alerts, pop-ups, and notifications to improve user interaction and experience.
- The system integrator will develop a functional prototype development, it will build an interactive version of the design, allowing users to test the flow and functionality.
- The crucial step is to gather the user feedback on the prototype and incorporating those insights and design refinements and fine tuning it.

11.3.1 Functional prototype development

SI to develop functional prototypes for PMCC and selected key stakeholders to experience the portal's workflow firsthand, to gather insights for refinement.

Following should be the key aspects of functional prototype development:

- Interactive design implementation – develop wireframe with clickable elements, simulated navigation, and real-time interactions.
- Performance & responsiveness testing – develop the design that adapts across different devices, screen sizes, and operating systems.
- Error & usability refinement – identify pain points in navigation, accessibility issues, and workflow bottlenecks before full development.
- Integration simulation – test API connections, database interactions, and system module transitions to ensure seamless functionality.
- Stakeholder review & approval – conduct structured evaluations with key decision-makers to finalize improvements before coding begins.
- User testing & feedback loop – prototype for PMCC and select key stakeholders to gather feedback on functionality and usability. This is the final step to gather the user feedback on the prototype and incorporating those insights and design refinements to fine tune the portal design.

11.4 Phase 4: Portal development & module integration

11.4.1 Agile development methodology

The agile development methodology emphasizes flexibility, collaboration, and iterative progress to integrate complex systems efficiently. SI to follow following key aspects in this regard:

- The SI will emphasize on agile development methodology as it's a crucial process for portal development and module integration.
- Continuous Integration (CI): SI to follow CI practices, ensuring that new functionality is developed, tested, integrated, and validated continuously.
- Frequent testing: SI to ensure that execution encourages automated testing at multiple levels, including unit, integration, and end-to-end testing, to identify issues early.
- Incremental development: SI to ensure that large integration projects are broken down into smaller, manageable increments, allowing teams to adapt quickly to changes.

- Collaboration across teams: SI to work closely with PMCC to ensure seamless integration and alignment with functional goals.
- DevOps practices: SI to incorporate DevOps principles, such as CI/CD pipelines, to streamline deployment and improve efficiency.

11.4.2 Parallel module development & module interconnectivity

Parallel module development and module interconnectivity are crucial in Agile system integration. SI to ensure:

- Parallel module development: agile methodology is followed to allow multiple teams to develop different modules simultaneously, reducing time-to-market and improving efficiency. Each module is built independently but follows standardized interfaces to ensure seamless integration.
- Module interconnectivity: well-defined APIs and integration frameworks are developed to enable smooth communication between modules. Agile methodology to promote continuous integration and testing to detect and resolve interconnectivity issues early.
- Independent deployment: modular architecture to support independent deployment, allowing updates to specific modules without disrupting the entire system.
- Cross-functional collaboration: agile methodology to foster collaboration between developers and testers to ensure modules are developed cohesively and promptly.

11.4.3 Data security & compliance implementation

SI must ensure that robust data security and compliance mechanisms are integrated into the agile development process by embedding security practices throughout the software development lifecycle. The SI should adhere to the following general guidelines:

- Shift-left security - Integrate security early in the development lifecycle by conducting threat modelling, secure design reviews, and code analysis during the planning and development phases.
- Secure coding practices - Follow industry-standard secure coding guidelines (e.g., OWASP Top 10) and ensure developers are trained in identifying and mitigating common vulnerabilities.

- Automated security testing - Incorporate static and dynamic application security testing (SAST/DAST) tools into the CI/CD pipeline to detect vulnerabilities early and continuously.
- Access control and identity management - Implement role-based access controls (RBAC), enforce least privilege principles, and use secure authentication mechanisms (e.g., MFA, OAuth).
- Data protection and privacy - Ensure encryption of sensitive data at rest and in transit, and comply with relevant data protection regulations (e.g., GDPR, DPDP Act, GIGW 3.0 etc.).
- Compliance monitoring - Continuously monitor for compliance with applicable standards (e.g., ISO 27001, PCI-DSS) and maintain audit trails for all critical activities.
- Security champions - Designate security champions within agile teams to advocate for security best practices and act as liaisons with the security team.
- Vulnerability management - Establish a process for timely identification, prioritization, and remediation of vulnerabilities, including third-party dependencies.
- Incident response preparedness - Develop and test incident response plans to ensure quick and effective handling of security breaches or compliance violations.
- Continuous improvement - Regularly review and update security practices based on lessons learned, threat intelligence, and evolving regulatory requirements.

11.4.4 API development

API development in Agile system integration focuses on flexibility, scalability, and collaboration. Here's how it works:

The System Integrator (SI) is expected to follow the practices outlined below to ensure effective, scalable, and collaborative API development within the agile delivery model:

- Adopt an API-first approach - Begin with API design before development. This ensures well-defined integration points and supports flexibility and reusability across systems.
- Implement continuous integration and automated testing - Integrate APIs into CI/CD pipelines with automated testing to maintain reliability, detect issues early, and accelerate delivery.

- Utilize microservices architecture - Design APIs as independent, modular services to enable scalability, ease of maintenance, and parallel development by multiple teams.
- Apply mocking and contract-first development - Use API mocking to reduce interdependencies and speed up development. Define API contracts upfront to ensure consistency and alignment across teams.

11.5 Phase 5: Testing and validation

11.5.1 User Acceptance Testing (UAT)

User Acceptance Testing (UAT) marks one of the final phases of software testing, where the system integrator initiates a comprehensive validation process involving PMCC. This critical step ensures that the developed portal aligns with business needs and expectations, verifying its functionality, usability, and overall performance. PMCC will interact with the system to assess whether it meets the defined operational requirements. By simulating real usage conditions, UAT will help confirm that the developed system is both effective and intuitive, ensuring a seamless experience for stakeholders.

During the UAT phase, PMCC will test various functionalities, workflows, and integrations to identify any inconsistencies or potential issues. They would assess whether features function as intended, ensuring compliance with business specifications and industry standards. Any deviations or defects discovered during this process will be documented and shared with the development team for resolution before the system goes live.

Additionally, security and access control mechanisms will be validated to safeguard sensitive data and enhance system reliability. Ultimately, successful completion of UAT will signify that the portal is ready for deployment, providing confidence that it will fulfil its intended purpose efficiently and effectively. UAT will only be performed after completing unit, integration, and system testing, and resolving high-priority defects.

11.5.2 Stakeholder pilot testing

After completing the UAT phase, the SI will proceed with stakeholder pilot testing, which serves as a final step before full deployment. This phase will involve testing the portal with a select group of representative users or stakeholders who will interact with the system in real-world conditions. The primary goal of this testing is to gather meaningful feedback, identify any remaining technical or usability issues, and ensure that the portal fully meets the business and functional requirements. By allowing stakeholders to engage with the portal before its official launch, the

development team can refine key features, address concerns, and enhance the overall user experience.

During stakeholder pilot testing, selected participants will evaluate the portal's navigation flow, data accuracy, security protocols, and overall performance. Their insights will be instrumental in fine-tuning the system, resolving any usability bottlenecks, and ensuring a smooth transition to full deployment. The feedback gathered in this phase will be documented and reviewed by the development team in coordination with PMCC, allowing SI to make necessary refinements before releasing the final version.

The pilot testing minimizes potential disruptions post-launch, as it ensures stakeholders are familiar with the portal's functionalities and can seamlessly integrate it into their operational workflows. This approach significantly enhances user adoption rates and ensures that the portal delivers a seamless, intuitive, and efficient experience for its intended audience.

Pilot testing with help identify usability issues, workflow problems, and any unforeseen challenges that may arise in a real-world environment.

Optimization & debugging

In accordance with the type of code by the system integrator the debugging and optimization process can be executed and implemented for the code developed by the system integrator.

To improve the speed, efficiency, and resources utilization of a program, the system integrator will make changes to the code or algorithm to reduce execution time, memory usage, and other performance bottlenecks.

To locate, identify and fix errors or bugs in the code, the system integrator will use debugging tools to step through the code, inspect variables, and trace the flow of execution.

11.6 Phase 6: Deployment and evaluation

11.6.1 Final deployment

Final deployment of the portal will be done after finishing all the above steps satisfactorily. Deployment & Evaluation Phase represents the formal transition of the portal from a development environment to a live operational setting, and must be executed in a controlled, structured, and stakeholder-aware manner. This phase begins with the deployment of the final, production-ready version of the portal into a secure and scalable hosting environment approved by DGS. The System Integrator (SI) will follow a phased rollout approach—starting with a limited go-live (soft launch) involving selected stakeholders nominated by PMCC. This allows for real-

time monitoring of portal behavior under realistic workloads while ensuring that any last-minute functional, performance, or integration anomalies are identified and resolved quickly.

Comprehensive system-level and performance validations will be carried out, including end-to-end flow testing, data synchronization verification, uptime and load handling, and security validation in the live environment. The SI will ensure that all role-based access controls and data visibility parameters function as intended to avoid misrouting of sensitive industry data. Simultaneously, evaluation protocols will be triggered to assess the portal's alignment with functional requirements outlined in the SRS and its compliance with national IT standards and maritime regulations.

The evaluation will also include structured stakeholder feedback capture, where users from across different categories—shipyards, classification bodies, regulators, and others—will interact with the portal and submit feedback through embedded tools or PMCC-facilitated workshops. Key performance indicators (KPIs) such as page load speed, module response time, system stability, error rates, and user satisfaction scores will be continuously monitored through a real-time performance dashboard configured by the SI.

Post-deployment audits will be conducted jointly with PMCC to verify security configurations, data integrity, and feature completeness. Based on this evaluation, a post-launch refinement sprint may be conducted to address high-priority issues before transitioning to the next phase. At the conclusion of this phase, the SI will submit a Deployment and Evaluation Report documenting the go-live process, system readiness, stakeholder observations, corrective actions undertaken, and recommendations for future upgrades—ensuring a data-driven handover into the Operations and Maintenance Phase.

11.7 Phase 7: Post-implementation support & continuous enhancement

11.7.1 Ongoing maintenance & technical support

In order to run the system smoothly, the system integrator will have regular updates, patches, and bug fixes to keep the system running smoothly and securely.

Post-implementation support & continuous enhancement is a crucial phase in ensuring the long-term success and sustainability of the portal. After deployment, the focus shifts to maintaining system stability, optimizing performance, and enhancing user adoption through targeted support

and training programs. This phase ensures that the portal remains efficient, scalable, and adaptable to evolving business needs and technological advancements.

Once the portal is live, continuous maintenance is necessary to fix bugs, address security vulnerabilities, and implement periodic updates. The technical support team will actively monitor system health, addressing any user-reported issues or performance inconsistencies. Regular software patches, framework upgrades, and compliance updates will be applied to keep the system secure and fully functional. Additionally, help desk support, ticketing systems, and real-time troubleshooting mechanisms will be established to assist users whenever they encounter technical challenges.

11.7.2 Performance monitoring & scalability

To ensure optimal efficiency, performance metrics such as response time, load balancing, and system uptime are continuously tracked. Monitoring tools will analyze the portal usage patterns to identify potential bottlenecks or scalability issues, allowing proactive optimization. As user demands grow, scalability strategies such as cloud resource expansion, database optimization, and load distribution techniques are implemented to prevent downtime or slow processing speeds. Automated health checks and predictive analytics assist in maintaining a stable and high-performing environment.

11.7.3 User training & adoption

The SI will be responsible for ensuring effective user training and adoption of the portal through the following actions:

- Deliver structured training programs including user guides, onboarding sessions, and interactive tutorials to equip stakeholders with the knowledge to use the portal efficiently.
- Conduct workshops and personalized training modules to help users navigate key functionalities and build confidence in using the system.
- Establish feedback collection mechanisms to gather user input for continuous improvement and user-centric enhancements.
- Implement adoption strategies such as real-world case studies and hands-on practice environments to drive user engagement and proficiency.
- Provide technical support to assist users with troubleshooting, resolving issues, and addressing queries during and after onboarding.
- Monitor key performance indicators such as response times, resource utilization, and system stability to proactively identify and address bottlenecks.

- Ensure scalability and performance by validating that the system can handle increased user loads without degradation in performance.
- Support transition and change management by guiding users through system changes, addressing concerns, and ensuring a smooth adoption experience.
- Continuously evaluate system performance and user feedback to identify opportunities for optimization and implement new features aligned with evolving business needs and market trends.

12. Project Monitoring and Control Committee

12. Project Monitoring and Control Committee

The successful deployment of portal which meets all functional and technical requirements, requires a well-structured approach. To adhere to this structured approach, a Project Monitoring and Control Committee (PMCC) will be constituted, comprising of DG Shipping officials and KPMG team-members after onboarding of SI. The objective of PMCC will be to ensure that SI develops the portal as per agreed specifications and portal meets the requisite expectations.

As part of PMCC, KPMG team's role will be to oversee the entire portal development lifecycle to make sure that the project remains on track in terms of scope, quality, schedule, and budget. KPMG team will coordinate with SI for the seamless portal execution, adherence to quality standards, and alignment with client expectations. KPMG team will also assist in proactively resolving any challenges / issues, encountered during portal development.

This section includes the details of KPMG team's approach, collaboration outline with SI, supervision of portal development, and quality control strategies to be adopted, to ensure that portal development follows a well-defined and structured path.

12.1 Collaboration with SI

The KPMG team will ensure effective collaboration with SI for seamless portal development and will have following key responsibilities:

12.1.1 Defining roles and responsibilities

- Engage with the SI, ensure clarity on scope, deliverables, and reporting structures.
- Ensure planned activities by SI align with the DPR requirements.

12.1.2 Requirement clarification & technical alignment

- Facilitate detailed discussions between DG Shipping and SI, to ensure accurate translation of business needs into functional and technical specifications.
- Ensure the FRS and SRS developed by SI align with the DPR requirements.

12.1.3 Periodic reviews & status monitoring

- Organize regular (weekly/bi-weekly/monthly) progress review meetings to assess development progress, identify bottlenecks, and assist DG Shipping in implementing corrective actions.
- Track project execution against the agreed roadmap, milestones, and Service Level Agreements (SLAs).

12.1.4 Issue resolution

- Establish an escalation mechanism to resolve technical challenges, delays, or quality concerns with SI's development team.
- Appraise DG Shipping officials about the issues and challenges during execution and coordinate with SI to resolve them

12.1.5 Change management & scope control

- Evaluate any change requests raised during the development phase to and their impact on timelines and costs.
- Ensure scope adherence to prevent uncontrolled deviations from agreed functionalities.

12.1.6 Performance testing & quality assurance

- Define acceptance criteria for deliverables to ensure system functionality, performance, and security.
- Collaborate with SI for User Acceptance Testing (UAT) and bug resolution before final deployment.

12.1.7 Integration with external systems

- Ensure SI integrates the portal with existing databases, government systems, and third-party APIs as required by DG Shipping (e.g., linkage to SBFAP Portal or e-Samudra Portal, MoPSW portal etc.).
- Review SI's approach to data security, access control, and interoperability with external digital platforms.

12.1.8 Ensuring documentation & handover

- Oversee the SI's documentation of system architecture, workflows, and admin controls for future maintenance.
- Ensure knowledge transfer from the SI to DG Shipping officials for long-term system sustainability.

12.2 Development of detailed FRS and SRS by SI

SI is responsible for developing the detailed FRS and SRS documents based on the requirements mentioned in DPR. These documents will serve as the blueprint for portal development and ensure that all functional and non-functional requirements are clearly defined, structured, and aligned with requisite expectations.

The PMCC will oversee and validate the detailed FRS and SRS development to confirm that documents meet project objectives and DG Shipping expectations. The KPMG team will supervise the FRS and SRS development by SI, who will undertake the following key responsibilities & activities:

12.2.1 Requirement analysis & documentation

- Translation of functional requirements from the DPR document into detailed functional/non-functional/technical requirements in the detailed FRS and SRS documents.
- Define the system capabilities, workflows, data flows, integrations, security protocols, and performance parameters.
- Incorporate inputs from DG Shipping and other major industry stakeholders into system design considerations.
- Conduct stakeholder sessions (about 25-30) using structured formats to capture qualitative and quantitative inputs.

12.2.2 System architecture & technical design

- Define the overall architecture of the portal, including frontend, backend, database design, and API integrations.
- Detail the system infrastructure, specifying hardware, cloud deployment models (or alternate models, as required by DG Shipping), and scalability considerations.
- Outline the data storage mechanisms, backup strategies, and breakdown recovery plans.

12.2.3 Module-wise specifications

The FRS and SRS document will break down each module's functionality, including but not limited to:

- Capability Insights module (Stakeholder profiling including past & ongoing project listings, Capability Assessment Framework (CAF) creation & updates, verification workflows etc.).
- Collaboration hub (Forums, expert Q&A, private discussion spaces).
- Finance & Insurance module (information on govt. schemes, sector-specific financial products, investor-stakeholder matchmaking etc.).
- Regulatory compliance module (information on regulatory updates, repository of industry standards & other related documents).

- Innovation centre (R&D partnerships, technology demonstration, funding opportunities etc.).
- Technical library module (technical documents, ship design guidelines, research papers etc.)
- Training & certification module (information on training programs, certifications, and skill development courses offered by training institutes)
- Industry directory module (comprehensive database of shipbuilding and repair stakeholders, search and filter options, verification mechanism for DGS etc.)

12.2.4 User roles & access control

- Define user access levels (e.g., shipyards, regulators, investors, training institutes, design agencies, R&D agencies etc.).
- Implement role-based access controls to ensure data privacy and controlled information sharing.

12.2.5 User experience & mobile optimization

- Develop an intuitive and user-friendly UI/UX for seamless stakeholder interaction.
- Ensure mobile compatibility for accessibility across devices (only a responsive web design is required at this stage; the development of native mobile application is not expected).
- Implement Bi-lingual (English and Hindi) support to cater to diverse industry participants.

12.2.6 Data flow & system integration

- Detail how data will flow between different modules and external systems (as required).
- Define Application programming interfaces (APIs) for integration with existing government portals (as required) (e.g., SBFAP portal, e-Samudra portal, MoPSW portal etc.).

12.2.7 Security & compliance standards

- Specify security protocols, including encryption, authentication, and access control mechanisms.
- Ensure adherence to Indian and global cybersecurity guidelines, including ISO 27001 for information security.
- Detail audit trails and logging mechanisms for system activities.

12.2.8 Performance & load testing parameters

- Define expected performance benchmarks (e.g., response time, system uptime, concurrent users).
- Establish methodologies for stress testing, load balancing, and high-availability configurations.

12.2.9 Validation & review process

- Ensure the SRS aligns with business needs and regulatory compliance before approval.
- Incorporate PMCC comments and other required modifications in SRS during multiple review cycles, before finalizing the document for portal development.

12.3 Quality control and management

The KPMG team of PMCC Unit will monitor adherence to the quality control measures established by SI throughout the portal development, ensuring compliance with technical, functional, security, and performance benchmarks.

The quality management approach of SI will focus on preventing defects, ensuring compliance with standards, and continuous monitoring to identify and resolve issues proactively. The SI will undertake the following key responsibilities & activities in this regard, which will be reviewed and monitored (and approved, where applicable) by the PMCC:

12.3.1 Establishment of quality standards & compliance criteria

- Ensure compliance with:
    - DG Shipping & Government of India IT guidelines.
    - Cybersecurity & Data Privacy Standards (e.g., ISO 27001, GDPR-like frameworks, CERT-In guidelines).
    - Interoperability requirements with external databases and digital platforms through APIs.
- Document quality benchmarks for software performance, security, and user experience.

12.3.2 Development phase quality assurance

- Implement a development & implementation of Software Development Life Cycle (SDLC) Quality Assurance Process, ensuring that each development stage is reviewed before moving to the next.
- Follow Agile/Scrum methodology with iterative testing and stakeholder feedback.

- Establish peer code review processes to maintain coding standards.

12.3.3 Testing & validation framework

- Functional testing
    - Verify that each module meets functional specifications as outlined in the detailed FRS, prepared by SI and approved by PMCC.
    - Conduct use-case scenario testing to ensure real-world applicability.
- Unit Testing
    - Verify that each module meets specifications as outlined in the detailed FRS and SRS.
    - Conduct use-case scenario testing to ensure real-world applicability.
- Security testing
    - Perform penetration testing & vulnerability assessments to identify risks.
    - Implement data encryption, role-based access control, and audit logging mechanisms.
- Performance & load testing
    - Test system performance under normal & peak loads.
    - Establish benchmarks for page load time, concurrent users, API response time.
- User Acceptance Testing (UAT)
    - Conduct UAT sessions with key stakeholders before Go-Live.
    - Address user feedback and finalize system improvements.
- Integration testing
    - Validate third-party API integrations (e.g., SBFAP, e-Samudra, MoPSW etc.).
    - Ensure data consistency across modules.
- Content Validation
    - Implement a moderation system for content validation such as automated flagging of inappropriate content (detect and flag violations like offensive language, hate speech, or explicit material), sentiment analysis (analyse overall user sentiment), spam detection (filter out spam or irrelevant content), content categorization

(organize content by tags or topics), user behaviour monitoring (detect unusual patterns or behaviours) etc.

- Ensure seamless functionality before final deployment.

12.3.4 Continuous monitoring & issue resolution

- Implement automated monitoring tools for tracking system performance.
- Define issue escalation mechanisms for quick resolution.
- Maintain a Bug Tracking & Resolution Dashboard for real-time visibility.
- Conduct periodic quality audits to identify areas of improvement.

12.3.5 Final Go-Live quality assessment

- Verify that all performance, security, and compliance requirements are met.
- Conduct final regression testing to ensure that recent updates have not affected existing functionalities.
- Prepare a Quality Compliance Report for approval before system deployment.

13. Project Monitoring and Evaluation Framework

13. Project Monitoring and Evaluation Framework

The project Monitoring and Evaluation (M&E) framework will ensure that the development, deployment, and operational performance of the portal align with intended objectives, stakeholder expectations, and industry requirements. The framework is aimed at maintaining high standards of quality, operational reliability, and long-term sustainability for the portal project. It establishes a structured mechanism to track Key Performance Indicators (KPIs), assess project progress, and implement continuous improvements until the portal reaches full operational stability.

The PMCC will oversee the M&E framework by defining measurable success criteria, tracking system performance, gathering stakeholder feedback, and recommending corrective actions where necessary. This structured approach will facilitate data-driven decision-making, enhance accountability for each element, and ensure continuous refinement of portal functionalities. Key aspects of M&E Framework will include:

- Key Performance Indicators (KPIs) and performance measurement
    - Measurable indicators to be defined for system reliability, user engagement, system security parameters etc.
    - SI to develop dashboards and generate periodic reports.
- Feedback loops & improvement mechanisms
    - User feedback to be captured to drive portal enhancements.
    - An iterative review process to be implemented to refine functionalities during portal development and post-launch.
- Tracking & evaluation until Go-Live
    - Periodic assessments to be conducted to ensure timely milestone completion.
    - Potential challenges to be identified and deviations from planned objectives to be addressed.

13.1 Key Performance Indicators and performance measurement

13.1.1 Key Performance Indicators (KPIs)

KPIs have been devised to make sure that portal is effectively monitored and maintained. These KPIs will evaluate the technical performance, user engagement, operational usefulness, and

impact of the portal on Indian shipbuilding ecosystem. This will ensure that portal functions smoothly, is useful for the ecosystem and meets the objectives set by DG Shipping.

Below are preliminary KPIs intended to guide the System Integrator during design and implementation of the Admin Dashboard. They are grouped to reflect how DGS officials would typically monitor the platform health: technical performance, adoption and engagement, content quality and freshness, collaboration activity, regulatory/compliance dissemination, finance/insurance discovery flows, training listings, stakeholder directory depth, etc.

These KPIs illustrate the type of performance, adoption, content, collaboration, regulatory, finance, security, and operational metrics that can be computed directly from portal data streams, but they are not exhaustive, and the final KPI set—including definitions, targets, visualizations, and refresh cadences—will be suggested by the SI, reviewed and signed-off by the PMCC during the portal development phase, consistent with dashboard best practices to align indicators to objectives, and iterate based on feedback. PMCC may include additional KPIs in the project scope during the development phase.

a) Technical Performance and Reliability

- Portal uptime (%): Share of time the portal is available in the measured period, aligned with the minimum uptime target; computed via monitoring logs.
- Average page load time (seconds): Median/95th percentile load time under normal load; sourced from APM metrics.
- API response time (milliseconds): Median/95th percentile latency for key integrated systems (e.g., SBFAP, e-Samudra, MoPSW etc.); monitored via API gateway logs.
- Error rate (%): Ratio of error responses/page errors to total requests; from web/app logs.
- Data processing speed (milliseconds): Time to assemble and render key composite views (e.g., capability dashboards).

b) User Adoption and Engagement

- Total registered users (count, with breakdown by stakeholder category): Shipyards, repair yards, design agencies, ancillary industry, R&D, training institutes, financiers/insurers, regulators, ports, owners; driven by registration database.
- Active users (% over period): Daily/weekly/monthly activity rate among registered users; derived from authenticated session logs.

- Module utilization rates (% by module): Share of active users interacting with Collaboration Hub, Capability Insights, Finance & Insurance, Technical Library, Regulatory & Compliance modules; computed from clickstream/feature usage events.
- User feedback score (1–10): Average rating from in-portal surveys; dashboard trend over time.

c) Content moderation and quality (Technical Library, Capability Profiles, Finance/Insurance)

- Number of technical documents uploaded (count): Total documents in the Technical Library and monthly additions; from CMS.
- Verification rate (%): Share of newly submitted stakeholder data and documents verified by DGS Admin prior publication on portal; from workflow engine.
- Content moderation efficiency (days): Average time from submission to approval/publication where moderation is required; from moderation logs.
- Freshness index (% up-to-date records): Share of profiles/documents validated within a defined recency window; computed via last-verified timestamps.
- Archive/obsolescence actions (count): Volume of content archived or superseded in period; from CMS change logs.

d) Collaboration Hub activity

- Forum activity (discussions/month): Count of new threads initiated in Collaboration Hub per time window; from forum database.
- Participation breadth (unique contributors/month): Distinct users posting or commenting; indicates community health.
- Time-to-first-response (hours): Median time for a new thread to receive a first reply; service quality proxy.
- Resolution/closure rate (%): Share of threads marked resolved/answered; operational effectiveness indicator.

e) Regulatory and Compliance dissemination

- Regulatory updates published (count): Number of new or revised regulations/circulars posted in period.
- Average time-to-publish regulatory updates (days): From regulator submission/intake to publication; measures dissemination efficiency.

- Compliance content reach (views/downloads): Aggregate interactions with regulatory content; indicates industry awareness and usage.

f) Finance & Insurance discovery and interest signals

- Financial schemes listed (count) and last refresh date: Total active schemes/products; data completeness/freshness.
- Click-through rate (CTR) on financial assistance links (%): User interest in external funding portals (e.g., SBFAP); available as a DPR KPI.
- Investment opportunities posted (count): Number of opportunities curated by period; also a DPR KPI.
- Investor/finance inquiries (count): Tracked interactions or expressions of interest initiated via the portal's finance module.

g) Stakeholder Directory depth and data coverage

- Coverage by category (count and % of known universe where applicable): Number of shipyards, repair yards, ancillary suppliers, design agencies, training institutes, classification/test labs, etc., with verified profiles.
- Profile completeness score (avg %): Weighted completeness across required fields (infrastructure, capacity, certifications, past projects).
- Update cadence compliance (%): Share of key stakeholders adhering to periodic data refresh cycles as defined in 14.1 content stewardship.

h) Market intelligence and Capability Insights

- Capability profiles published/updated (count): New or refreshed capability entries in Capability Insights.
- Project listings (completed/ongoing) in Capability Insights (count): As defined in DPR collaboration/capability modules, tracked per period.
- Documented case studies/best practices (count): Additions to capability knowledge base.

i) Training listings and discovery (current aggregation mode)

- Training institutes profiled (count): Verified training centre profiles available.
- Course listings published (count): Number of current training/certification offerings listed (aggregate, since delivery is via external providers at this stage).

- Training content reach (views/click-outs): Interactions with training listings and redirects to institutes.

j) Security and risk monitoring

- Cybersecurity incidents (count): Notable incidents detected in the period; part of DPR's security KPI set.
- Access control violations (count): Unauthorized access attempts or RBAC violations detected.
- Backup and recovery time (minutes): Time taken in last drill or incident; DPR metric.
- Open vulnerabilities (count) and patching cadence (avg days-to-patch): Governance for vulnerability management.

k) Administrative process efficiency (Ops Governance)

- Incident response SLA adherence (%): Share of incidents acknowledged/resolved within SLA by severity.
- Change request throughput (count) and turnaround time (days): CRs raised vs. released; average time through CAB.
- Release stability (post-release defect rate): Incidents per release or hotfix; quality proxy.

l) Policy and intelligence intake (early-state coordination)

- Policy/notification documents published (count): Number of policy/ regulatory/ intelligence items posted from authorities.
- Source diversity (count of contributing agencies): Indicates breadth of authoritative inputs (regulators, associations, etc.).
- Content usage (views/downloads/queries): Measures the practical uptake of posted policy/ intelligence.

Above illustrative KPIs are shown in the table below:

KPI Name	Definition /How it's measured	Primary data source in Portal	Notes for Admin Dashboard
KPI Category - Technical performance & reliability			

KPI Name	Definition /How it's measured	Primary data source in Portal	Notes for Admin Dashboard
Portal uptime (%)	Percentage of time the portal is available during the period	Infrastructure/APM monitoring logs	Executive tile with trend line
Average page load time (s)	Median/95th percentile page load under normal load	Web performance/APM	Track by key pages/modules
API response time (ms)	Median/95th percentile latency for integrated APIs	API gateway logs	Segment by each integration
Error rate (%)	Errors as a share of total requests	Web/app logs	Pair with incident counts
Data processing speed (ms)	Time to assemble/render composite views	APM/custom timers	For capability and directory views
KPI Category - User adoption & engagement			
Total registered users (count)	Cumulative registered accounts by stakeholder type	User directory/auth DB	Breakdown by category
Active users (DAU/WAU/MAU %)	Share of registered users active in period	Session/auth logs	Show DAU/MAU ratio
Module utilization rate (%)	% of active users using each module	Feature usage/clickstream	Rank top 5 modules
User feedback score (1–10)	Average in-portal satisfaction rating	Survey/feedback widget	Trend with comments sample
KPI Category - Content moderation & quality			
Technical documents published (count)	Total and new additions in period	CMS/Library	Show by document type

KPI Name	Definition /How it's measured	Primary data source in Portal	Notes for Admin Dashboard
Verification rate (%)	% of submissions verified before publish	Workflow engine	Separate profiles vs documents
Moderation turnaround (days)	Avg. submission-to-publication time	Moderation logs	SLA adherence flag
Freshness index (%)	% of items verified/updated within recency window	CMS timestamps	Heatmap by module
Archival/superseded items (count)	Content retired or replaced in period	CMS change logs	Indicates hygiene activity
KPI Category - Collaboration hub			
New discussions (count/month)	Threads created per period	Forum DB	Sparkline trend
Unique contributors (count/month)	Distinct posters/commenters	Forum DB	Community health indicator
Time-to-first-response (hours)	Median time to first reply	Forum DB	Service quality proxy
Resolution/closure rate (%)	% threads marked answered/resolved	Forum DB	Tagging discipline needed
KPI Category - Regulatory & compliance			
Regulatory updates published (count)	New/updated circulars, notices	Regulatory module CMS	With source authority tags
Time-to-publish (days)	Intake to publish duration	Content workflow logs	SLA visualization

KPI Name	Definition /How it's measured	Primary data source in Portal	Notes for Admin Dashboard
Content reach (views/downloads)	Interactions with regulatory items	Web analytics/CMS	Top documents list
KPI Category - Finance & insurance			
Financial schemes listed (count)	Active schemes/products visible	Finance module CMS	With last refresh date
CTR to finance links (%)	Click-through to external finance portals	Web analytics/link tracker	Campaign effectiveness
Investment opportunities (count)	Opportunities listed in period	Finance/Investment module	Pipeline visibility
Finance inquiries (count)	Expressions of interest initiated	Forms/CRM connector	Lead flow indicator
KPI Category - Stakeholder directory			
Coverage by category (count/%)	Verified profiles by stakeholder type	Directory DB	Compare to known universe (if available)
Profile completeness (avg %)	Weighted field completion score	Profile metadata	Highlight gaps by category
Update cadence compliance (%)	Share adhering to scheduled refresh	Workflow/calendar logs	Nudge non-compliant entities
KPI Category - Market intelligence & capability			
Capability profiles updated (count)	New/updated capability entries	Capability module	Tie to search demand

KPI Name	Definition /How it's measured	Primary data source in Portal	Notes for Admin Dashboard
Project listings (count)	Ongoing/completed projects recorded	Capability/collab modules	Periodic change
Case studies/best practices (count)	New additions to knowledge base	CMS/Library	Quality indicator
KPI Category - Training listings & discovery			
Training institutes profiled (count)	Verified training centers available	Directory/CMS	Accreditation tags
Course listings (count)	Current courses aggregated/listed	Training listing module	With recency flags
Training content reach	Views and click-outs to providers	Web analytics	Interest heatmap
KPI Category - Security & risk			
Cybersecurity incidents (count)	Notable security events detected	SIEM/security logs	Severity breakdown
Access control violations (count)	Unauthorized/failed privileged access	IAM/RBAC logs	Alert on spikes
Backup/recovery time (minutes)	Last drill or event recovery time	DR/backup system logs	Compare to RTO
Open vulnerabilities (count)	Outstanding vulns and age	VA/PT reports, ticketing	Days-to-patch metric
KPI Category - Operational efficiency			
Incident SLA adherence (%)	Incidents within SLA by severity	ITSM/ticketing	Traffic light status

KPI Name	Definition /How it's measured	Primary data source in Portal	Notes for Admin Dashboard
Change request throughput (count)	CRs processed vs released	CAB/ITSM	Lead time per CR
Post-release defect rate	Incidents per release/hotfix	Release mgmt + ITSM	Release quality proxy
KPI Category - Policy & intelligence intake			
Policy/notification items (count)	Posted policy/intelligence docs	CMS/Regulatory	By source type
Source diversity (count)	Contributing authorities/agencies	CMS metadata	Breadth of inputs
Usage of policy content	Views/downloads/search queries	Web analytics/CMS	Guides content prioritization

13.1.2 How to present KPIs on Admin Dashboard

The following illustrates a suggested approach for presenting KPIs on the Admin Dashboard. The System Integrator will propose final presentation formats during project execution, for PMCC review and approval.

- Executive summary tiles: Uptime, active users, module utilization leaders, forum activity, security incidents, CTR to finance links.
- Trend charts: Uptime, load time, active users, document uploads/ verification rate, regulatory updates and their reach, forum discussions and response times.
- Heatmaps: Module utilization by stakeholder category; content freshness across modules.
- Funnel views: Awareness → registration → profile verification/publish → module use.
- Alerts: SLA breaches (incident response/moderation), content recency thresholds, security incident flags.

13.1.3 Data sources and feasibility

All KPIs above may be computed using:

- Monitoring/APM logs for performance and reliability.
- Authentication/session and event telemetry for adoption and module usage.
- CMS/workflow engines for content counts, verification, moderation timings, and freshness.
- Forum databases for collaboration metrics.
- Finance/training listing modules for listing volumes and CTR/click-outs.
- Security telemetry and ticketing for incidents, violations, backup/recovery.
- Change/incident management tools for operations KPIs.

13.2 Feedback loops and improvement mechanisms

An organized feedback and improvement mechanism will be implemented throughout the portal development, testing, and pre-launch phases to ensure that all stakeholder expectations, technical requirements, and industry needs are effectively met.

This process will comprise of continuous stakeholder engagement, iterative testing, pro-active issue resolution, and performance optimization to refine the portal before its official launch. This process will ensure that the portal will evolve to align with industry expectations, and will ensure a robust, high-performing, and user-friendly platform at Go-Live.

13.2.1 Key feedback collection mechanisms

- Stakeholder consultations & workshops
    - Regular deliberations with DG Shipping and other key stakeholders will be conducted to validate the portal features and its functionalities.
    - Industry-wide surveys will be held to gather insights on module usability, key missing features, and expected enhancements.
- Pilot testing & User Acceptance Testing (UAT)
    - An early access will be provided to the selected mix of major stakeholders (shipyards, ancillaries, training institutes etc., as agreed with PMCC) to gather real-time usability feedback.
    - UAT sessions will be conducted through SI in multiple phases with major stakeholders, in order to capture issues in module navigation, overall performance, and system responsiveness.

- User feedback will be collected to identify missing functionalities, usability concerns, or process inefficiencies before launch and, required changes / modifications will be incorporated in the portal.

- Real-time feedback channels
  - Feedback collection forms will be integrated into all the portal modules for continuous user inputs.
  - Live chat support & ticketing system will be developed to log feature requests, usability issues, and functionality concerns.
  - Email-based reporting will also be made available to collect detailed stakeholder concerns and feedback.

13.2.2 Iterative improvement mechanisms

- Agile development approach with sprint-based portal functionality refinements
  - Periodic (weekly/monthly) development sprints will be implemented to incorporate feedback from PMCC and other stakeholders.
  - Critical fixes, feature enhancements, and UI/UX improvements will be prioritized in each iteration.
- Bug tracking & issue resolution framework
  - A centralized issue-tracking system will be established by SI; to identify, categorize, and resolve technical issues faced by portal users.
  - Issues will be classified in following 3 categories:
    - High priority (Critical feature failures, security vulnerabilities).
    - Medium priority (Performance optimization, user experience enhancements).
    - Low priority (UI enhancements, minor usability improvements).
- Beta testing phase before Go-Live
  - A full-scale beta testing will be conducted with a diverse set of industry users (to be agreed with PMCC) to validate functionality, security, and performance of the portal.
  - Insights will be gathered on stakeholder onboarding, Capability Assessment Framework (CAF) updates, module workflows, and module usability.
- Performance benchmarking & system optimization

- Load testing & stress testing will be conducted by SI to assess the system stability under high traffic conditions.
- API integrations will be tested and optimized for seamless connectivity with external platforms (e.g., SBFAP, e-Samudra, MoPSW etc.as directed by DGS).
- System responsiveness will be tested and tweaked for improved user experience.

13.2.3 Pre-Go-Live enhancements based on user feedback

- Final usability testing & stakeholder validation will be conducted to ensure seamless navigation and efficient module functioning.
- Technical documentation will be prepared & training sessions will be held by SI for various users – e.g., shipyards, financial institutions, regulators etc. to familiarize them with the portal's features and functionalities.
- Final implementation of pending UI/UX refinements, security patches, and system enhancements will be completed before full-scale deployment.

13.3 Tracking & evaluation until Go-Live

A structured tracking and evaluation framework will be prepared by SI in consultation with PMCC. This framework will be implemented from the pre-development phase until Go-Live to ensure successful deployment of the portal. This framework will assist PMCC to monitor development progress, assess SI performance, and validate portal functionalities to ensure that the portal meets the technical, operational, and stakeholder expectations before launch.

Through this framework, the portal development will be continuously monitored, ensuring that all modules, integrations, security protocols, and user functionalities are optimized before Go-Live. Following steps are involved in the framework which will be complied with by SI:

13.3.1 Development & progress tracking

- Establish a milestone-based tracking system by:
  - Defining critical milestones (e.g., completion of SRS, individual module development, integration testing, UAT, security audits etc.).
  - Developing a Project Monitoring Dashboard, to track real-time progress.
  - Regular progress reporting to PMCC and key stakeholders (as required and agreed with DG Shipping).
- Periodic status reviews to be conducted with PMCC in following manner:

- Weekly reviews to assess ongoing development.
- Fortnightly joint reviews (PMCC and SI), to evaluate module-wise progress.

- Identify bottlenecks and factors affecting deliverable timelines as and when encountered. Same to be brought to early notice of PMCC for resolution.

13.3.2 Module-wise functional testing & validation

- Verification of each module against SRS
  - Ensure that all modules meet pre-defined requirements in SRS.
  - Evaluate module completion rates and feature implementation through test cases.
- Integration testing & API validation
  - Ensure seamless connectivity with external portals (e.g., SBFAP, e-Samudra, MoPSW, etc.).
  - Evaluate data exchange accuracy, API response time, and security protocols.

13.3.3 Performance & security evaluation

- System load testing & scalability assessment
  - Measure system performance under simulated high-traffic conditions.
  - Ensure the portal can handle concurrent user activity without lag or downtime.
  - Benchmark system uptime against the target of 99% availability.
- Cybersecurity & compliance audits
  - Conduct penetration testing, vulnerability scanning, and encryption checks through SI to ensure there are no breaches.
  - Ensure compliance with applicable cybersecurity guidelines and ISO 27001 standards.
  - Review role-based access controls to prevent unauthorized data access.

13.3.4 User Acceptance Testing (UAT) & stakeholder validation

- Early access to key stakeholders (as selected by PMCC) for live testing
  - Stakeholders to test their respective modules, providing structured feedback.
  - Missing functionalities, usability concerns, or process inefficiencies to be identified before launch.

- Feedback incorporation & refinements
    - Bugs, errors, and suggested improvements to be tracked in an issue-tracking system, developed by the SI.
    - Prioritize fixes based on criticality (high, medium, low priority).
    - Implement design and functionality refinements before final deployment.

13.3.5 Go-Live readiness & final pre-launch checks

- Final system validation & sign-off
    - Perform last-stage quality assurance (QA) tests before deployment.
    - Conduct final review sessions in presence of PMCC for DG Shipping sign-off.
- Technical documentation & user training
    - Develop user manuals and training guides for shipyards and other industry stakeholders.
    - Organize training workshops for stakeholders to ensure smooth adoption.
- Launch readiness assessment
    - Confirm the system meets performance, security, and functional benchmarks.
    - Finalize the Go-Live date and post-launch support plan with PMCC.

14. Post-implementation operations strategy

14. Post-implementation operations strategy

This chapter outlines the post-implementation strategy for the Comprehensive Shipbuilding and Ship Repair Portal, expanding its scope beyond technical operations and maintenance to a holistic roadmap that delivers sustained ecosystem value over time. It reframes post-go-live activities as a continuous program of stabilization, adoption, integration, and strategic enhancement aligned with Theme 5 of Maritime India Vision (MIV) 2030. The System Integrator will play a central role in this post-implementation strategy, assisting DG Shipping to implement, operate, and continuously monitor the measures outlined in this chapter, ensuring disciplined execution and sustained portal performance.

This chapter is structured to:

- Define how the portal will be operated, governed, and improved after go-live, covering reliability, security, content management, user support, and performance monitoring.
- Establish a time-bounded roadmap of short-, medium-, and long-term goals and benefits that guide functional evolution of portal over time, ensuring every enhancement directly strengthens India's competitiveness in shipbuilding and repair.
- Integrate institutional coordination with sector stakeholders to sustain high-quality data flows, policy intelligence, and cluster development on the platform.

Immediately after launch, the emphasis will be on system stabilization, user confidence, awareness-building, and onboarding to establish a critical mass of engaged stakeholders and credible content on the portal. In the medium term, functional expansion focuses on mobility, trust, skills, talent, and inter-governmental coordination—through a dedicated mobile app, interactive e-learning with digital certificates, a job posting and workforce database, and a formal coordination mechanism with State Maritime Boards to update state-level policies, cluster initiatives, and incentives into a single, authoritative interface. In the long term, the strategy prioritizes deep ecosystem integration and export competitiveness—through procurement integration (GEM/CPPP and private procurement), ERP-linked project tracking for transparency and capacity visibility, and shipyard cluster integration—to catalyse large-scale, globally competitive delivery.

The chapter also links each strategic enhancement to MIV 2030 Theme 5 priorities—channelling domestic demand to Indian yards, standardizing skills and processes, accelerating cluster development, and elevating India's brand in global shipbuilding and repair markets, etc.—so that every post-implementation action advances national maritime goals.

Following sections are included in this chapter in detail:

- Operational management and governance
- Short-term goals (0–6 months Post–Go-Live)
- Medium-term goals (6–24 months Post–Go-Live)
- Long-term goals (>24 months Post–Go-Live)

This integrated approach ensures the portal remains reliable and secure while progressively unlocking higher-order outcomes—operational excellence, skilled workforce readiness, transparent procurement and delivery, and globally competitive performance—consistent with the project's mandate and the sector's transformation objectives under MIV 2030.

14.1 Operational management and governance

14.1.1 Portal maintenance & technical support

To ensure the long-term stability, security, and efficiency of the portal, a structured maintenance and technical support framework will need to be implemented. This will cover regular system updates, security monitoring, performance optimization, and user support mechanisms to maintain seamless operations. Additionally, a dedicated team will be required for ongoing monitoring and maintenance by engaging required technical resources from the System Integrator (SI) for technical maintenance and support.

By implementing a proactive maintenance approach, enforcing security protocols, and establishing a strong support framework with engagement of necessary resources, the portal will remain technically robust, user-friendly, and aligned with industry standards for long-term sustainability.

Following elements are required to be considered for maintenance and support framework after deployment of the portal:

i. System maintenance & upgrades

- Implementation of scheduled software updates to enhance functionality and user experience.
- Regular performance tuning and optimization to improve system response time and scalability.
- Continuous API maintenance to ensure seamless integration with external platforms (e.g., SBFAP, e-Samudra, MoPSW etc.).

- Manage ongoing system enhancements and bug fixes.

ii. Security & risk management

- Monitoring of cybersecurity measures, including firewalls, intrusion detection systems, and data encryption.
- Regular vulnerability assessments and penetration testing to detect and mitigate security risks.
- Regular monitoring and update of role-based access controls to prevent unauthorized data access.
- Adherence to government IT security standards and ISO 27001 guidelines for data protection.

iii. Bug fixes & issue resolution

- Maintenance of a ticket-based issue tracking system for reporting and resolving technical problems.
- Categorization of issues into high, medium, and low priority, ensuring critical fixes are addressed immediately.
- Continuous debugging and error resolution to maintain system stability.

iv. Data backup & disaster recovery

- Implementation of automated daily/weekly backups to prevent data loss.
- Development of a disaster recovery plan, ensuring quick system restoration in case of server failure or cyberattacks.
- Regular testing of backup and recovery processes to validate effectiveness.

v. User support & helpdesk operations

- Assign a dedicated technical support team for addressing user queries and troubleshooting issues.
- Integrate frequently asked questions (FAQs), helpdesk support, and chatbot assistance for self-service problem resolution.
- Continue multi-channel support (email, phone, live chat) for stakeholder convenience.
- Regular / requirement-based training sessions for users and administrators on portal functionalities.

vi. Performance monitoring & reporting

- Continuous monitoring of system uptime (target: >99%) to ensure high availability.
- Monitor the real-time analytics dashboards to track system load, user activity, and API performance.
- Review and act on monthly and quarterly technical reports to maintain portal health and perform required improvements.

vii. Compliance with industry trends & regulations

- Ensure alignment with evolving regulatory requirements for the web portal.
- Updating modules to reflect new government incentives, training programs, and investment opportunities.
- Collaborating with international maritime forums to bring global expertise to the platform.
- Update the system to comply with new laws, regulations, and standards.

14.1.2 Content moderation & quality control

To ensure the accuracy, relevance, and credibility of information available on the portal, a defined content moderation and quality control mechanism will need to be implemented. This will involve verification of data submitted by stakeholder, regulatory compliance checks, ongoing content updates, and strict moderation of user interactions. The required number of additional resources may be employed through SI to oversee these activities. Alternatively, required IRS resources may be retained by DG Shipping to oversee content moderation and ensure industry standards are upheld.

By implementing a defined content moderation and quality control system, supported by retained IRS personnel or other competent resources (as DGS may deem fit), the portal will maintain high data accuracy, industry credibility, and compliance with maritime regulations, ensuring it remains a trusted source for the shipbuilding and ship repair industry.

i. Verification & approval of stakeholder-submitted data

- All new stakeholder registrations (shipyards, ancillary industries, design agencies, financial institutions, R&D institutes etc.) to undergo a verification process before their profiles are published.
- Submitted information, such as infrastructure details, certifications, and past projects, research data, financial product information etc. to be cross-checked with official channels to prevent misinformation and to maintain portal's integrity.

ii. Moderation of Collaboration Hub & discussion forums

- Real-time monitoring (as possible) of forum discussions, Q&A, and stakeholder engagements to prevent the spread of misinformation or non-compliant content.
- Moderators to flag inappropriate, misleading, or off-topic discussions for review.
- Expert verification system for technical and regulatory content to ensure accurate industry knowledge-sharing.
- Implementation of role-based posting privileges, where regulators and verified experts have higher visibility.

iii. Regulatory & compliance oversight

- Regular content updates to ensure regulatory announcements, compliance guidelines, and government policies are accurate and up to date.
- Dedicated compliance validation team to review legal and technical documents uploaded to the portal.
- Timely updating outdated compliance information, ensuring relevancy of portal.

iv. Review & curation of Technical Library and Finance & Insurance module content

- Periodic validation of documents in the Technical Library module, ensuring that standards, guidelines, and manuals are current and relevant.
- Quality assurance for Finance & Insurance listings, ensuring that all loan schemes, government subsidies, investor opportunities and insurance products remain valid and aligned with official announcements.
- Removal or archival of outdated, obsolete, or duplicated content.

v. Standardization & data integrity management

- Implementation of predefined content formatting guidelines to ensure consistency across all portal sections.
- Updating structured templates for shipyard profiles, funding opportunities, and training modules to maintain uniformity.
- Regular audits to identify missing, incomplete, or duplicate data, ensuring clean and well-organized information flow.

vi. Feedback-driven content improvement mechanism

- Regular feedback collection from shipyards, investors, design agencies, and training institutes to enhance content quality.
- Monitoring of reporting mechanism, allowing users to flag incorrect or outdated information.
- Conduct periodic content review cycles to assess content effectiveness and user engagement.

14.1.3 Periodic data updates & industry integration

To ensure that the portal remains accurate, relevant, and aligned with evolving industry trends, a structured mechanism for periodic data updates and industry integration will need to be implemented. This will involve regular updates to stakeholder profiles, industry statistics, financial assistance schemes, regulatory policies, and technical documents. Additionally, ongoing collaboration with shipyards, ancillary industries, financial institutions, regulators, and R&D agencies will facilitate seamless industry integration and data validation.

By implementing a defined periodic data update mechanism and ensuring seamless industry integration, the portal will remain a dynamic and up-to-date resource, supporting informed decision-making and industry-wide digital transformation. This will involve the following activities:

i. Regular updates to stakeholder profiles & capability data

- Periodic data validation and updates for shipyard profiles, including changes in infrastructure, projects, and workforce capabilities.
- Updates to design agency, financial institution, training institute, and ancillary industry profiles to reflect new offerings, partnerships, and certifications.
- Integration of newly onboarded stakeholders into the portal database.

ii. Updates to financial assistance, investment opportunities and insurance products

- Regular addition of new government subsidy schemes, credit facilities, and funding opportunities for shipbuilding and ship repair sector.
- Monitoring changes in financial schemes (e.g., SBFAP updates, bank loan products, investor partnerships) to maintain up-to-date listings.
- Quarterly validation of financial assistance information in collaboration with banks, investors, and policy regulators.

iii. Industry directory & market data enhancements

- Continuous refinement of the Industry Directory to include new shipyards, service providers, R&D agencies, training institutes, and other stakeholders.
- Updates to market intelligence data, including shipbuilding demand forecasts, emerging technologies, and policy shifts.
- Addition of case studies, market reports, and industry best practices to enrich the Technical Library module.

iv. Regulatory & compliance information updates

- Timely integration of new maritime policies, classification society standards, and compliance requirements.
- Continuous tracking of IMO regulations, environmental compliance mandates, and national policies for real-time updates.
- Automated notifications for regulatory changes, ensuring stakeholders remain informed.

v. Integration of latest R&D and innovation trends

- Collaboration with R&D agencies, design firms, and technology providers to showcase latest advancements in shipbuilding and repair industry.
- Inclusion of new green technology initiatives, such as hydrogen fuel propulsion, automation, smart shipbuilding etc.
- Updates to the Innovation Centre module with information on research projects, grants, and industry-academia collaborations.

vi. Seamless industry integration & data exchange

- Strengthening collaboration with stakeholders to facilitate seamless data sharing.
- Enhancing API-based integration with external portals.
- Coordinating with trade associations, investors, and skill development councils for regular exchange of industry insights.

vii. Stakeholder-driven data refresh mechanism

- Encouraging stakeholders to self-update their profiles and key information.
- Implementing a data submission workflow where stakeholders can propose updates, subject to DG Shipping verification.

- Establishing a yearly data validation cycle for major stakeholders to reconfirm their information.

viii. Data governance & accuracy control

- Implementation of data integrity audits; ensuring that outdated, incomplete, or duplicate records are corrected.
- Role-based access control to prevent unauthorized modifications to critical data.

14.1.4 User engagement & continuous improvement

To ensure sustained industry participation and long-term success, a defined user engagement and continuous improvement strategy will need to be implemented. This will focus on active stakeholder involvement, feature enhancements based on feedback, training and awareness programs, and data-driven refinements to improve the portal's effectiveness over time.

By implementing user engagement strategies and a continuous improvement framework, the portal will remain dynamic, user-friendly, and future-ready, ensuring long-term industry adoption and value generation. This will encompass the following elements:

i. Stakeholder engagement & community building

- Regular engagement with stakeholders to foster continuous participation.
- Dedicated stakeholder outreach programs, including interactive sessions, industry meetups, and online forums to strengthen collaboration.
- Effective continuation of role-based user groups to encourage industry networking and knowledge sharing.

ii. Feedback collection & iterative enhancements

- Review and monitoring of integrated structured feedback mechanisms, including:
  - User satisfaction surveys for portal usability and feature relevance.
  - Feedback submission forms within individual modules.
  - Live issue reporting system for technical glitches and content updates.
- Establishment of a feedback review committee to analyse stakeholder input and prioritize improvements.
- Quarterly feature update cycles to implement enhancements based on industry needs.

iii. User support & training programs

- Development of online helpdesk and knowledge base, including FAQs, video tutorials, and user manuals.
- Implementation of virtual training sessions and webinars to familiarize users with portal functionalities.
- Onboarding workshops for new industry stakeholders to ensure seamless adoption.
- Dedicated user support team, to address queries and concerns.

iv. Performance analytics & data-driven improvements

- Monitoring user behaviour through analytics dashboards to track engagement patterns.
- Identifying underutilized features and refining them for better adoption.
- Optimizing search functionality based on frequently accessed topics.
- Enhancing mobile responsiveness and accessibility for a better user experience.

v. Recognition for active users

- Implementation of a reputation system, where active contributors earn badges and credibility scores.
- Recognizing top contributors, industry experts, and thought leaders within the shipbuilding ecosystem.
- Showcasing success stories and best practices shared by stakeholders.

vi. Continuous content & feature upgrades

- Regular updates to industry guidelines, market insights, and financial schemes to keep the portal relevant.
- Adding new functionalities based on global development and user requirements.
- Strengthening collaboration hub features for better stakeholder interactions.
- Expanding API integrations with additional maritime databases and investment platforms.

14.2 Short-term goals (0–6 months Post–Go-Live)

This section details the immediate post–go-live priorities required to stabilize the platform, drive awareness, and onboard stakeholders in a disciplined, outcomes-focused manner. It operationalizes the governance and operating constructs described in previous section into a six-month execution plan that delivers reliable performance, credible content, and meaningful

early adoption. The short-term program emphasizes predictability, clarity, and trust: predictable system behaviour through stabilization; clarity through structured communication and guidance; and trust through verified information and responsive support.

The short-term strategy is built around three core goals: System stabilisation; Stakeholder awareness & outreach; and Stakeholder onboarding & engagement.

Goal	Functionalities and benefits
System stabilisation	• Operational reliability: Ensures the portal functions smoothly under real-world conditions, minimizing downtime and user disruption. • User confidence: Builds trust among stakeholders by delivering a consistent and error-free experience, encouraging sustained usage and engagement.
Stakeholder awareness & outreach	• Broad visibility: Stakeholders gain awareness of portal capabilities and use cases, laying the foundation for rapid ecosystem engagement. • Accelerated onboarding: A well-promoted campaign will catalyse increased user registrations, ensuring a critical mass of participants to drive network effects.
Stakeholder onboarding & engagement	• Rapid user growth: Achieve a user base of at least 1,500 registered stakeholders, creating a vibrant industry community. • Technical library enhancement: Curate and upload a minimum of 500 technical documents, research papers, and R&D insights, empowering users with standardized best practices.

Each goal is supported by clearly defined activities, deliverables, interfaces, and success indicators. Collectively, these measures establish the foundation for subsequent medium and long-term enhancements, ensuring the portal begins creating tangible value for the shipbuilding and repair ecosystem from early phase.

14.2.1 Goal: System stabilisation

The portal will enter a focused hypercare phase immediately after go-live to ensure stable, secure, and performant operations under real-world conditions. This phase is designed to translate the platform's technical readiness into dependable user experiences by combining continuous monitoring with disciplined incident, problem, and change management.

Stabilisation will involve continuous observability (infrastructure, application, and API health), rapid response to incidents, proactive performance tuning, and security hardening. The objective is to minimize disruptions, quickly remediate defects, and adapt configurations as traffic patterns

and user behaviour emerge. Backup and disaster recovery runbooks will be validated through drills, and connected systems will be re-verified as usage scales.

i. Scope of activities

- Hypercare monitoring and response
    - Real-time monitoring of uptime, latency, error rates, and API integrations.
    - Tiered on-call rotations with clear escalation paths for critical incidents.
- Performance and capacity tuning
    - Load and stress testing against emerging usage; scaling policies adjusted accordingly.
    - Query optimization, cache tuning, and content delivery improvements.
- Security hardening and compliance
    - Vulnerability scanning and prioritized patching; log review and SIEM (Security information and event management) correlation.
    - Access review for role-based permissions; reinforcement of least-privilege principles.
- Integration validation and data integrity
    - Re-validation of integrated services and data exchange workflows.
    - Reconciliation checks for critical data flows and scheduled jobs.
- Continuity and recovery assurances
    - Backup/restore drills; verification of Recovery Point Objective (RPO) and Recovery Time Objective (RTO) adherence.
    - Documented runbooks; rollback plans for emergency fixes and releases.

ii. Benefits

Operational reliability is achieved by ensuring the portal functions smoothly under real-world conditions, minimizing downtime and user disruption through proactive monitoring and rapid remediation. User confidence grows as stakeholders experience consistent performance, secure access, and prompt resolution of issues, encouraging sustained usage and deeper engagement with portal features.

iii. Deliverables

- Hypercare runbook, incident and RCA (Root Cause Analysis) logs, performance tuning records, and security hardening checklist.
- Validated integration reports; backup / Disaster Recovery drill reports; updated configuration baselines.
- Monthly stabilization dashboard summarizing reliability and remediation progress.

iv. Success Indicators

- Declining incident volume and severity; predictable release cadence for hotfixes.
- Consistently stable performance under peak loads; successful DR drill outcomes.
- Positive early user feedback on reliability and access experience.

14.2.2 Goal: Stakeholder awareness & outreach

A structured communication and engagement program will introduce the portal's purpose, capabilities, and usage pathways to the maritime ecosystem. The aim is to create broad-based awareness that converts into early platform interactions and informed onboarding.

Awareness will be driven through multi-channel outreach tailored to shipyards, repair facilities, design agencies, training institutions, financiers, insurers, regulators, and State Maritime Boards. Communications will focus on practical value—how the portal simplifies discovery, collaboration, and compliance—supported by explainer content and live demonstrations. Outreach will be coordinated with industry associations and events to maximize relevance and reach.

i. Scope of activities

- Communication campaigns
    - Launch announcements, explainer decks, and use-case narratives for each stakeholder segment.
    - Periodic newsletters and update notes highlighting new content and frequently asked questions.
- Engagement formats
    - Webinars, demos, and office-hours sessions for Q&A and guided walkthroughs.
    - Participation in industry conferences, roadshows, and cluster-level briefings.
- Adoption enablers

- “Getting Started” guides, role-based onboarding checklists, and short video tutorials.
- Centralized help resources (FAQs, quick tips) accessible within the portal.

ii. Benefits

Broad visibility ensures stakeholders understand the capabilities and practical use cases of the portal, laying the foundation for ecosystem-wide engagement and collaboration. Accelerated onboarding follows as targeted messaging and straightforward guidance reduce friction, catalysing user registrations and the early formation of a critical mass necessary for network effects.

iii. Deliverables

- Communication plan with editorial calendar; stakeholder-specific collateral and recordings.
- Public-facing onboarding and explainer resources; outreach analytics dashboard.
- Event participation summaries and follow-up pipelines for prospective onboardings.

iv. Success indicators

- Growth in inbound inquiries and portal sign-ups following campaigns.
- Engagement rates for content downloads.
- Conversion from awareness touchpoints to onboarding actions.

14.2.3 Goal: Stakeholder onboarding & engagement

Increased stakeholder onboarding will create a credible and active user base on the portal through guided help by admin team with verified profiles and a high-quality Technical Library. Early engagement in collaboration hub will encourage constructive participation and set standards for content quality and community behaviour.

The onboarding process is designed around role-based experiences that help each stakeholder category find value quickly. A formal intake workflow ensures that profiles and documents are verified before publication on portal. Orientation sessions and self-help resources would reduce friction for first-time users, and moderated collaboration areas seed healthy interactions.

i. Scope of activities

- Role-based onboarding journeys
  - Tailored steps for onboarding each category of stakeholders.

- Guided account setup, profile completion, and module functionality discovery paths.

- Verification and publication
  - Verification of stakeholder profile data and documents before publishing on portal during onboarding.
  - Verification during stakeholder data and document update prior publication.
- Collaboration and knowledge activation
  - Kick-off discussions in collaboration spaces; prompts for best-practice sharing.
  - Curated Technical Library seeding with standards, guidelines, research, case studies

ii. Benefits

User growth would create a vibrant industry community where timely information exchange and collaboration flourish. Technical Library enhancement would empower users with standardized best practices through a curated corpus of technical documents, research papers, and R&D insights, enabling informed decisions and improved execution across projects and operations.

iii. Deliverables

- Published, verified profiles across stakeholder categories; onboarding playbooks and FAQs.
- Baseline Technical Library with curated and tagged documents ready for unified search.
- Moderated collaboration spaces with community guidelines and escalation procedures.

iv. Success indicators

- Growth in registered stakeholders and completion of verified profiles.
- Active usage across modules and early contributions to collaboration spaces.
- Discoverability and utilization of Technical Library content in user journeys.

14.2.4 Short-term outcomes

By the end of the first six months post–go-live, the portal will demonstrate stable operations; clear visibility of its value among key stakeholders; a growing, verified user base; and an activated knowledge ecosystem through the Technical Library and collaboration spaces. These

outcomes collectively establish the platform's credibility and readiness to support the medium-term expansions and long-term integrations defined elsewhere in this chapter.

14.3 Mid-term goals (6–24 months Post–Go-Live)

This section sets out the medium-term priorities to deepen adoption, expand functional value, and institutionalize coordination after initial stabilization and onboarding. Building on the operating model described earlier, the focus over 6–24 months is to enhance user support at scale, extend access through mobility, consolidate authoritative state-level policy and cluster information, and strengthen talent discovery and planning.

Goal	Functionalities and benefits
AI Chatbot functionality	• Enhanced user support: Provides instant, conversational assistance to users, improving navigation, query resolution, and overall portal usability • Scalable interaction: Reduces dependency on manual support by automating responses to common queries, enabling efficient handling of high user volumes
Mobile application development	• Higher engagement: Personalized push notifications for training events, safety advisories, safe practices, and regulatory updates will boost active user sessions
Coordination enhancement with State Maritime Boards	• Central, up-to-date repository of state policies, incentives and cluster information • Better demand channelization and informed siting decisions
Job posting & workforce database	• Efficient recruitment: Centralized job board and advanced filters (skill, certification, experience, location) will reduce hiring lead times, ensuring critical projects are staffed without delay • Talent visibility & matching: AI-driven recommendations match candidate profiles to roles • Workforce planning: Aggregated analytics enable shipyards and clusters to forecast skill shortages, plan recruitment drives, and negotiate targeted training programs

Together, these initiatives position the portal as a daily-use operating platform for India's shipbuilding and repair ecosystem.

14.3.1 Goal: AI chatbot functionality

An AI-powered, conversational assistant can be embedded across key user journeys to answer common questions, guide users through tasks, and surface relevant resources contextually. The

chatbot will draw from curated knowledge bases, FAQs, and module-specific guides, with clear escalation paths to human support when needed.

i. Functionalities and benefits

- Enhanced user support: Provides instant, conversational assistance to users, improving navigation, query resolution, and overall portal usability.
- Scalable interaction: Reduces dependency on manual support by automating responses to common queries, enabling efficient handling of high user volumes.

ii. Deliverables

- Trained chatbot models, knowledge base curation workflows, and escalation rules.
- Analytics dashboards for query categories, resolution rates, and handoff quality.

iii. Success indicators

- Self-service resolution rates and reduced average time-to-answer.
- Decline in repetitive helpdesk tickets and improved user satisfaction scores.

14.3.2 Goal: Mobile application development

A dedicated mobile app can extend core portal capabilities with intuitive, role-based access and real-time notifications, ensuring stakeholders remain productive on the move. The app will prioritize quick actions—alerts, document access, collaboration updates, and approvals—while adhering to enterprise-grade security and privacy controls.

i. Functionalities and benefits

- Higher engagement: Personalized push notifications for training events, safety advisories, safe practices, and regulatory updates will boost active user sessions.

ii. Deliverables

- Mobile app (Android/iOS), release notes, and in-app onboarding guides.
- Notification management, role-based experiences, and usage analytics.

iii. Success indicators

- Growth in mobile adoption and engagement relative to web usage.
- Response timeliness to alerts and task completion initiated via mobile.

14.3.3 Goal: Coordination enhancement with State Maritime Boards

A formal, continuous interface with State Maritime Boards will be maintained to ingest, validate, and publish state-level policies, incentives, and shipyard cluster developments. This will enable an up-to-date, authoritative single window for stakeholders.

i. Functionalities and benefits

- Central, up-to-date repository of state policies, incentives and cluster information.
- Better demand channelization and informed siting decisions.

ii. Deliverables

- Standardized state microsites, document templates, and update logs.
- Coordination SOPs, contact registry, and analytics for content usage.

iii. Success indicators

- Stakeholder engagement with state content (views, downloads, queries).

14.3.4 Goal: Job posting & workforce database

A comprehensive talent module will support job postings, verified candidate profiles, and AI-enabled matching, complemented by workforce analytics for planners and cluster managers. Clear governance will ensure data quality, privacy, and fair use.

i. Functionalities and benefits

- Efficient recruitment: Centralized job board and advanced filters (skill, certification, experience, location) will reduce industry hiring lead times, ensuring critical projects are staffed without delay.
- Talent visibility & matching: AI-driven recommendations match candidate profiles to roles.
- Workforce planning: Aggregated analytics enable shipyards and clusters to forecast skill shortages, plan recruitment drives, and negotiate targeted training programs.

ii. Deliverables

- Employer and candidate workspaces, matching engine, and reporting suite.
- Verification workflows for profiles and privacy-protective access controls.

iii. Success indicators

- Improved time-to-fill, increased placements, and repeat employer usage.
- Utilization of workforce analytics by clusters and enterprises for planning.

14.3.5 Medium-term outcomes

By the end of 24 months post–go-live, the portal will deliver scalable, AI-enabled user support; sustained, mobile-led engagement; a single source of truth for state-level policies, incentives, and clusters; and a recruitment engine that improves matching efficiency and informs workforce planning. These outcomes mature the portal from a discovery platform into a daily operations backbone—advancing usability, transparency, and execution capacity across India's shipbuilding and repair ecosystem.

14.4 Long-term goals (>24 months Post–Go-Live)

This section sets out the long-term priorities to deepen ecosystem integration, enhance delivery transparency, catalyse cluster-led growth, and institutionalize continuous upskilling at scale. Building on the foundations laid in previous sections, the focus beyond 24 months is to embed market-facing capabilities (procurement), operational visibility (project tracking), regional economic coordination (shipyard cluster integration), and sustained human-capital development (interactive e-learning).

Goal	Functionalities and benefits
Procurement module	• Transparent sourcing: Centralized procurement channels provide clear visibility into tender opportunities, promoting fair competition and reducing procurement cycle time. • Optimized vendor selection: Entities leverage a unified portal to evaluate supplier credentials, capacity, and past performance.
Project tracking	• Progress visibility: Real-time dashboards display key project metrics—build stages, repair timelines, and resource allocation—enabling proactive issue resolution. • Capacity optimization: Continuous monitoring of yard utilization rates informs dynamic workload balancing and strategic investment planning.
Shipyard cluster integration	• Holistic cluster view: Industry participants assess multiple clusters' capabilities and benefits on a single platform, facilitating informed site selection and partnership decisions. • Ecosystem development: Visibility into cluster incentives and support mechanisms attracts investment, accelerating cluster growth.

Goal	Functionalities and benefits
Interactive E-Learning modules	• Continuous upskilling: Access to courses on green technologies, safety protocols, digital design tools, and regulatory compliance will improve workforce competency scores. • Standardized qualifications: Custom certificates aligned with DG Shipping and classification-society standards ensure uniform skill benchmarking.

Together, these initiatives would transform the portal from an information and coordination layer into a strategic infrastructure for India's shipbuilding and repair sector.

14.4.1 Goal: Procurement module

The portal can integrate public procurement feeds (e.g., government platforms) and enable a dedicated private-sector procurement channel, unifying discovery, evaluation, and submission workflows for industry specific tenders. Standardized templates, supplier profiles, and qualification data will streamline sourcing while audit trails reinforce fairness and compliance.

i. Functionalities and benefits

- Transparent sourcing: Centralized procurement channels would provide clear visibility into tender opportunities, promoting fair competition and reducing procurement cycle time.
- Optimized vendor selection: Entities can leverage a unified portal to evaluate supplier credentials, capacity, and past performance.

ii. Deliverables

- Unified tender discovery, supplier evaluation workspace, and submission support.
- Qualification criteria templates, supplier rating frameworks, and audit-ready logs.

iii. Success indicators

- Increased tender discovery-to-participation conversion.
- Reduced procurement cycle friction as observed through process analytics.

14.4.2 Goal: Project tracking

With prior discussions and mutual agreements - a secure, standards-based data interface can connect the portal with shipyard ERP systems to surface key progress indicators without exposing sensitive details. Role-based dashboards will present milestone status, resource allocation, dependencies, and risks, enabling proactive issue resolution and capacity planning.

i. Functionalities and benefits

- Progress visibility: Real-time dashboards can display key project metrics—build stages, repair timelines, and resource allocation—enabling proactive issue resolution.
- Capacity optimization: Continuous monitoring of yard utilization rates can inform dynamic workload balancing and strategic investment planning.

ii. Deliverables

- Project and capacity dashboards; integration adapters and data schemas.
- Governance for data sharing, consent, and confidentiality controls.

iii. Success indicators

- Improved schedule adherence and reduced unplanned idle time.
- Increased accuracy of capacity forecasts and utilization planning.

14.4.3 Goal: Shipyard cluster integration

The portal can host standardized microsites for recognized/approved clusters, aggregating infrastructure details, incentives, facilities, connectivity, and partner directories. Comparative views and matchmaking tools can help investors, builders, and suppliers evaluate locations, structure partnerships, and mobilize projects efficiently.

i. Functionalities and benefits

- Holistic cluster view: Industry participants can assess multiple clusters' capabilities and benefits on a single platform, facilitating informed site selection and partnership decisions.
- Ecosystem development: Visibility into cluster incentives and support mechanisms would attract investment, accelerating cluster growth.

ii. Deliverables

- Cluster profiles with standardized metadata; comparison tools and contact registries.

- Periodic refresh cycles, validation workflows, and analytics on engagement and investor interest.

iii. Success indicators

- Growth in cluster inquiries, MoUs, and partner onboarding.
- Increased distribution of projects across integrated clusters.

14.4.4 Goal: Interactive E-Learning modules

The Training & Certification Module can scale to advanced, industry-aligned programs co-developed with accredited institutes and global partners, emphasizing green technologies, safety, digital design, and regulatory compliance. Assessment and certification flows will ensure consistency and recognition across the industry.

i. Functionalities and benefits

- Continuous upskilling: Access to courses on green technologies, safety protocols, digital design tools, and regulatory compliance will improve workforce competency scores.
- Standardized qualifications: Custom certificates aligned with DG Shipping and classification-society standards will ensure uniform skill benchmarking.

ii. Deliverables

- Comprehensive learning catalogue with certification and badge systems
- Partner onboarding toolkit for institutes and domain experts; periodic content audits.

iii. Success indicators

- Growth in advanced course completions and recognized certifications.
- Increased employer adoption of standardized qualifications in hiring and deployment.

14.4.5 Long-term outcomes

Beyond 24 months, the portal will function as a strategic operating backbone for the sector: procurement becomes transparent and efficient; project execution is visible and manageable; clusters are discoverable and investment-ready; and the workforce continuously advances with standardized, industry-recognized credentials. These outcomes collectively strengthen delivery reliability, cost competitiveness, innovation capacity, and global positioning for India's shipbuilding and repair industry.

15. Annexures

Annexure 1 – List of Abbreviations

Acronym	Full Form
A&M	Approach & Methodology
AI	Artificial Intelligence
API	Application Programming Interface
AWS	Amazon Web Service
BIS	Bureau of Indian Standards
C	Complex
CANSI	China Association of the National Shipbuilding Industry
CCS	Carbon Capture Storage
CDAC	Centre for Development of Advanced Computing
CERT-In	Computer Emergency Response Team - India
CGT	Compensated Gross Tonnage
CI	Continuous Integration
CI/CD	Continuous Integration and Continuous Delivery/Deployment
CNY	Chinese Yuan Renminbi
CRUD	Create, Read, Update, Delete
CSIC	China Shipbuilding Industry Corporation
CSS	Cascading Style Sheets
CTR	Click Through Rate
DAST	Dynamic Application Security Testing
DGS	Directorate General of Shipping
DPDP Act	Digital Personal Data Protection Act
DPR	Detailed Project Report
DWT	Dead Weight Tonnage

Acronym	Full Form
ELK Developer	Elasticsearch, Logstash, Kibana Developer
ELT	Extract, Load, Transform
EoI	Expression of Interest
FDI	Foreign Direct Investment
FICCI	Federation of Indian Chambers of Commerce and Industry
FRS	Functional Requirements Specification
FSD	Functional Specification Document
FTWZ	Free Trade Warehousing Zones
FY	Financial Year
GDPR	General Data Protection Regulation
GIGW 3.0	Guidelines for Indian Government Websites and Mobile
GT	Gross Tonnage
GTTP	Green Tug Transition Programme
IMDA	Indian Marine Design Agencies
IMO	Indian Maritime Organization
IMU	Indian Maritime University
INSA	Indian National Shipowner's Association
IOR	Indian Ocean Region
IoT	Internet of Things
IRS	Indian Register of Shipping
ISO	International Organization for Standardization
JBIC	Japan Bank for International Cooperation
JMC	Japan Maritime Cluster
JOIN	Japan Overseas Infrastructure Investment Corporation for Transport & Urban Development

Acronym	Full Form
JS	JavaScript
JSEA	Japan Ship Exporter's Association
KPI	Key Performance Indicator
L	Low Complexity
LNG	Liquid Nitrogen Gas
M	Medium Complexity
M&E	Monitoring and Evaluation
MAC NET	Maritime Cluster Networking in Korea
MAKV 2047	Maritime Amrit Kaal Vision 2047
MDF	Maritime Development Fund
MEITY	Ministry of Electronics and Information Technology
MIIT	Ministry of Industry and Information Technology (MIIT) of China
MIV 2030	Maritime India Vision 2030
MLIT	Ministry of Land, Infrastructure, Transport and Tourism (Japan)
MoPSW	Ministry of Ports, Shipping and Waterways
MSMEs	Micro, Small, and Medium Enterprises
MTPA	Million Tonnes Per Annum
NCLT	National Company Law Tribunal
NEDO	New Energy and Industrial Technology Development Organization
NOx	Nitrogen Oxides (includes nitric oxide (NO) and nitrogen dioxide (NO2))
OECD	Organisation for Economic Co-operation and Development
OWASP	Open Web Application Security Project
PBOC	People's Bank of China
PCI-DSS	Payment Card Industry Data Security Standard

Acronym	Full Form
PMCC	Project Monitoring & Control Committee
QA	Quality Assurance
R&D	Research and Development
RBAC	Role Based Access Control
REoI	Request for Expression of Interest
REST	Representational State Transfer
RFP	Request For Proposal
ROI	Return on Investment
RO-RO	Roll-On/Roll-Off Vessels
SAI	Shipyard Association of India
SAJ	Shipbuilders' Association of Japan
SAST	Static Application Security Testing
SBFAP	Shipbuilding Financial Assistance Policy
SCAF	Shipyard Capability Assessment Framework
SDLC	Systems Development Life Cycle
SI	System Integrator
SLAs	Service Level Agreements
SOEs	State-Owned Enterprises
SOP	Standard Operating Procedure
SOx	Sulfur Oxides (includes sulfur dioxide (SO2) and sulfur trioxide (SO3))
SRS	Software Requirements Specification
TAT	Turn Around Time
UAT	User Acceptance Testing
UI/UX	User Interface/User Experience

Acronym	Full Form
VC	Very Complex
VHF	Very High Frequency
VL	Very Low Complexity
WCAG	Web Content Accessibility Guidelines

Annexure 2 – Preliminary functional requirements

1. Introduction

1.1 Document Purpose

This document presents the preliminary functional requirements for the development of a comprehensive web portal dedicated to shipbuilding and ship repair industry in India, as envisioned by the Directorate General of Shipping (DGS). It serves as an initial guideline to help system integrator understand the broad functional expectations and conceptual framework of the proposed system.

The functionalities and scope outlined herein are indicative and not exhaustive. They are intended to provide directional clarity and facilitate early-stage planning and alignment. The system integrator is advised to treat this document as a reference point for further analysis and refinement.

1.2 Scope

The scope of this document is to provide a high-level overview of anticipated modules, user roles, workflows, and integration points. It is intended to guide the system integrator in understanding the functional landscape and preparing for detailed requirement finalization.

1.3 Overview

The document aims to understand the process to be followed for browsing, accessing and updating various sections of the portal, collaborate, prepare statistics and requirements for both front-end (FE) users and back-end (BE) users.

During the execution phase, the detailed functionalities and final scope of work will be collaboratively discussed and mutually finalized in consultation with the Project Monitoring and Control Committee (PMCC). Based on these discussions, the system integrator will be responsible for preparing the comprehensive Functional Requirements Specification (FRS), which will incorporate all agreed-upon features, workflows, and integrations. This finalized FRS shall be submitted to DGS for formal review and approval prior to commencement of detailed design and development activities.

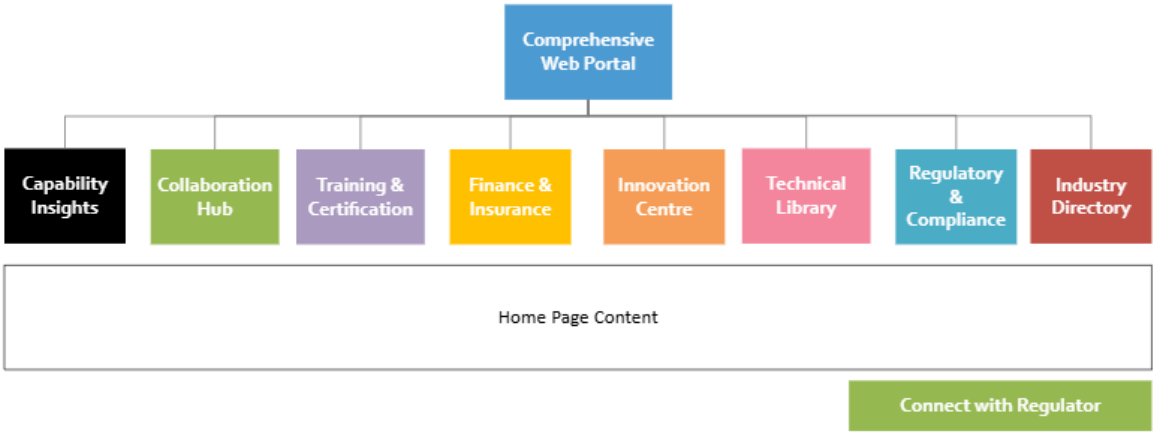


Figure 7 Common Module

2. Homepage Module

2.1 Purpose

This module aims to simplify the access to all the technical information related to the shipbuilding and ship repair industry. The library will become a central repository for all the technical information that FE users can see anytime. Any information that has to be updated will have to be done through the BE users.

2.2 Scope

This document covers FE users and BE users functionality of the Homepage module.

2.3 Overview

The document aims at understanding the process to be followed for browsing, accessing and updating the technical documents and requirements for both FE users and BE users. These requirements are captured through a study of the business functions, discussion with relevant stakeholders and study of global practices.

Additionally, this module will have a functionality of Brochure printing tab and as well it will display the list of Event calendar for year and the upcoming event will be displayed in the portal in scroll/flash for the user.

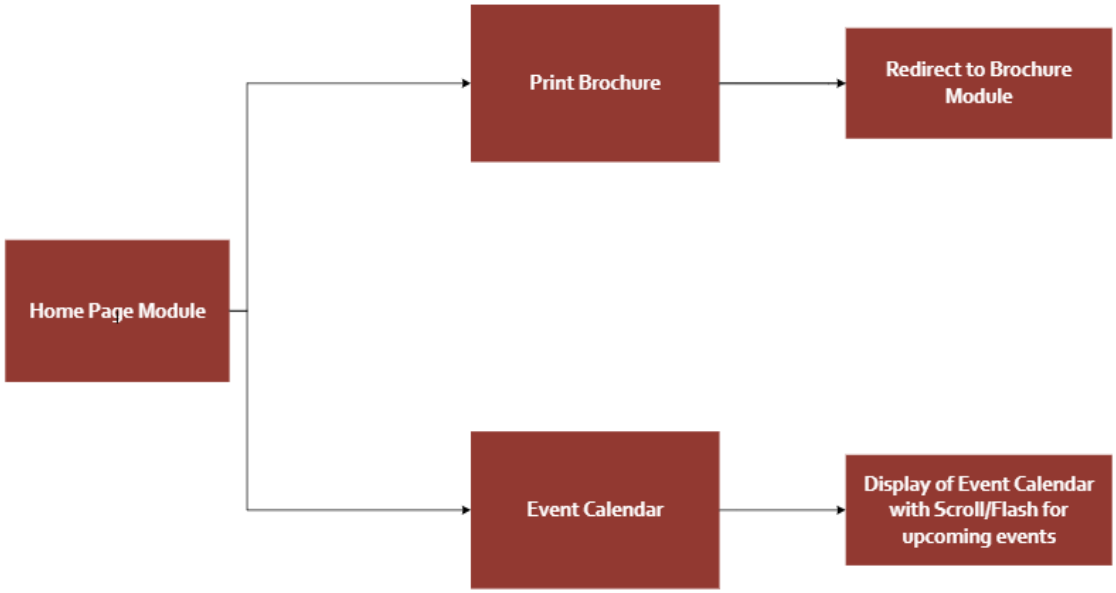

Home Page Module
Print Brochure
Redirect to Brochure Module
Event Calendar
Display of Event Calendar with Scroll/Flash for upcoming events

Figure 8 Home Page Module

User Characteristics

User	User Role	User Characteristics
FE user	The Front-End user will enter their inputs in the form of questionnaire during the si gn-up process	— Front End User — Regulators who are verified and r egistered in the portal
BE User	The Back End user approve the profile cr eation request to be sent to the regulator	— Back End User will validate the in puts provided by the stakeholders

2.4 Process Overview

i. **User Registration Initiation**:

   a. The user navigates to the Sign-Up page.

   b. The user selects their category from a dropdown menu (e.g., individual, organization, etc.).

   c. Based on the selected category, the user fills out a registration form tailored to their specific needs.

   d. Alternatively, the user can be prompted to fill out a detailed questionnaire after their first login to complete their profile.

ii. **Document Upload**:

   a. The user uploads the required verification documents (e.g., ID proof, business registration documents).

   b. The system provides clear instructions and acceptable formats for document uploads.

iii. **DGS Review and Approval**:

   a. The submitted registration and documents are reviewed by DGS.

b. The DGS verifies the information and documents to ensure they meet the necessary criteria.

c. Upon successful verification, the DGS approves the registration.

iv. **Notification of Approval**:

a. Once approved, the system automatically sends an email to the user containing their UserID and a temporary password.

b. The user also receives an SMS notification with the same information.

v. **Initial Login and Password Change**:

a. The user logs in using the provided credentials (UserID and temporary password).

b. Upon first login, the user is prompted to change their password to something more secure.

vi. **Password Policy Enforcement**:

a. The new password must adhere to the platform's password policy, which includes requirements such as:

i. At least one uppercase letter
ii. At least one lowercase letter
iii. At least one number
iv. At least one special character
v. Minimum length (e.g., 12 characters) for better security

vii. **Access to Home Page**:

a. After successfully changing the password, the user is redirected to the home page.

b. The home page displays all available modules and other relevant content.

c. The user can now navigate and select any module from this page to access specific functionalities.

viii. **Captcha Implementation**:

a. The login page includes a Captcha feature to prevent automated bot attempts.

i. The Captcha ensures that only legitimate users can access the system by verifying human interaction.

ix. Recent Activity

a. The homepage/profile page will include a Recent “Activity tab” listing 5 recent activities on the portal and an “Activity History” button for users to track all of their interactions across the portal

x. My Account Page

a. Each user will have access to a **"My Account"** page containing the following subsections:

xi. My Profile

a. Displays user profile details.
b. Any changes made to profile information will trigger a backend approval request for review by an **admin or backend (BE) user**.

xii. Change Password

a. Users can change their password using a **One-Time Password (OTP)** verification process.

xiii. My Activity

a. Displays a summary of user activities.
b. Shows last login time and date at the bottom of the page.

xiv. My Groups

a. Lists all groups the user has joined.

xv. My Documents

a. Displays the activity history of uploaded and downloaded documents.

xvi. **Access Control**:

a. Users with technical writing profile rights can view both uploaded and downloaded document history.
b. Other users can only view downloaded document history.

xvii. Testimony Submission

a. A "Submit Testimony" button will be displayed near the bottom right corner of the homepage.
b. Clicking the button opens a rich text editor allowing users to:
   - Write testimonial posts.
   - Attach images or documents to the post.

xviii. Testimony Highlights

a. A rotating snippet section will showcase top successful testimonies in short form.
b. A "View All" button will be placed at the end of the snippet section to navigate to the full list of testimonies.

xix. Search Functionality

Search Functional Requirements

The system shall integrate a robust search interface powered by Elasticsearch to deliver precise, fast, and context-aware results across all modules. The search functionality shall support both structured and natural language queries, enhancing user experience across diverse use cases.

The Elasticsearch engine shall enable full-text search, faceted filtering, autocomplete suggestions, fuzzy matching for typo tolerance, and relevance-based ranking. Users shall be able to retrieve documents, records, or content using structured queries and filters such as date ranges, categories, and tags. The system shall also support synonym mapping and custom analyzers to improve search accuracy and adaptability to domain-specific terminology.

To ensure scalability and performance, the system shall be designed to handle high query volumes with low latency. It shall include monitoring and feedback mechanisms to continuously improve search relevance. Security features such as role-based access control and audit logging shall be implemented to protect sensitive data and ensure compliance with organizational policies.

Location-Based, Profile-Based, and Product-Based Search Features

The system shall support location-based search capabilities to enable users to retrieve region-specific information across all modules. Users shall be able to query data using structured filters based on geographic parameters such as state, district, port zone, or coastal corridor. For example, a user may search for “radar suppliers in and around Kerala region” or “ship repair yards near Visakhapatnam.” The system shall leverage geospatial indexing and Elasticsearch’s geo-query features to deliver accurate, localized results.

In addition, the platform shall implement profile-based search personalization, tailoring results based on the user’s role (e.g., shipyard, ancillary supplier, regulator, designer, investor), organization type (e.g., MSME, PSU, private), and historical interactions. For instance, a small shipyard operator may search for “funding schemes available for small shipyards” and receive filtered results from the Finance and Insurance module, including government schemes, subsidies, and loan programs relevant to their profile.

The system shall also support product-based search and discovery, enabling users to find suppliers, technical documents, or regulatory guidelines based on specific equipment, materials, or services. Within the Technical Library, users can search for items like “ISO standards for marine engines” or “welding procedures for aluminum hulls.” In the Capacity Insights module, users may search for “consultants for ship designing in Gujarat” or “vendors for ballast water treatment systems.”

Each module shall integrate these search capabilities. Some examples include:

- **Finance and Insurance Module**: Enables discovery of funding schemes, insurance products, and financial services based on user type, location, and project scale.
- **Technical Library**: Allows retrieval of manuals, standards, and specifications using product names, categories, or technical keywords.
- **Regulatory Module**: Supports search for regulations, policies, circulars, inspection protocols etc. by vessel type, region, or regulatory body.

- **Collaboration Hub**: Facilitates matchmaking between shipyards, suppliers, designers, service providers etc. using location, expertise, and product/service tags.

These features shall be accessible via a unified search interface, ensuring a seamless and intelligent user experience across the platform.

xx. Feedback system and floating feedback button

The homepage shall include a **"Send Feedback" floating button** that opens a dedicated feedback submission page. This page shall allow users to submit feedback under three distinct categories:

1. **Suggestions** – for portal improvements or general ideas related to the shipbuilding industry.
2. **Queries** – regarding regulations, designs, policies, incentives, or other domain-specific concerns. These queries may be reviewed and used to generate future FAQs.
3. **Grievances** – for reporting issues, complaints, or concerns of any nature.

To prevent spam and bot activity, only the registered users will be able to submit the feedback form after they log in and shall require users to complete a CAPTCHA verification before submission. Username and registered email ID shall be captured automatically in the feedback form, from the user's profile. Users will then click the Submit or Send button to post their feedback.

Feedback submission will prompt a pop up with Feedback reference number. A copy of this feedback will be automatically emailed to the user, registering the feedback.

The users shall be able to browse previously submitted feedbacks through reference number, and through My feedback sub-section under My Activity in My Account section. However, only registered users shall be permitted to submit new feedback entries. This ensures accountability and enables better tracking of user interactions.

xxi. Backend User (BE User) Feedback Management

Backend users (BE users) shall have access to a dedicated tab in their profile for managing submitted feedback. They will be able to view, filter, and respond to feedback entries. The system shall provide standard response templates for quick replies, along with a text box for personalized responses. BE users shall also have the ability to select feedback entries and generate downloadable files for printing physical copies, supporting offline review and documentation.

To maintain platform integrity, BE users shall be empowered to warn and/or ban users temporarily or permanently in cases of malicious or abusive feedback submissions. This moderation capability ensures a safe and constructive environment for all stakeholders.

2.5 Front office flow

1. Login to the application and access relevant web-form: The Front-End User is supposed to fill the data base field and then upload the documents for verification.

2. Back End User: The Back End user will verify all the details and after verifying the supporting documents they will be successfully registered with an SRN.

3. Acknowledgement: The user will also receive an email/SMS on the registered email ID/mobile number confirming submission of the applicable field in the login page.

2.6 Back-office Flow

Processing by Authorizing Officer (AO): The respective Back End user logins to the portal and approves the profiles of individual stakeholders.

3. Capability Insights Module

3.1 Purpose

This module aims to provide a capability insight for the stakeholders and will showcase the detailed profile of each registered stakeholder including its capacity & capability. In this module the stakeholders can showcase their past, ongoing and upcoming projects. Based on the inputs provided by the stakeholder a capability assessment framework will be developed.

3.2 Module Scope

This document covers FE users and BE users functionality of the Capability insights module.

3.3 Module Overview

The document aims at understanding the process to be followed for the capability assessment framework module. A detailed study and analysis is provided for the process of the capability assessment.

This module will provide user the functionality of displaying the demand aggregation from government agencies and PSUs it will display the existing demand in shipbuilding and also allow the user to share or add the new upcoming demands, opportunities coming up in the portal which will help the user to understand the demands in Indian shipbuilding sector.

This module will receive inputs from:

User Registration and Login (Front End User)

3.4 Process Overview

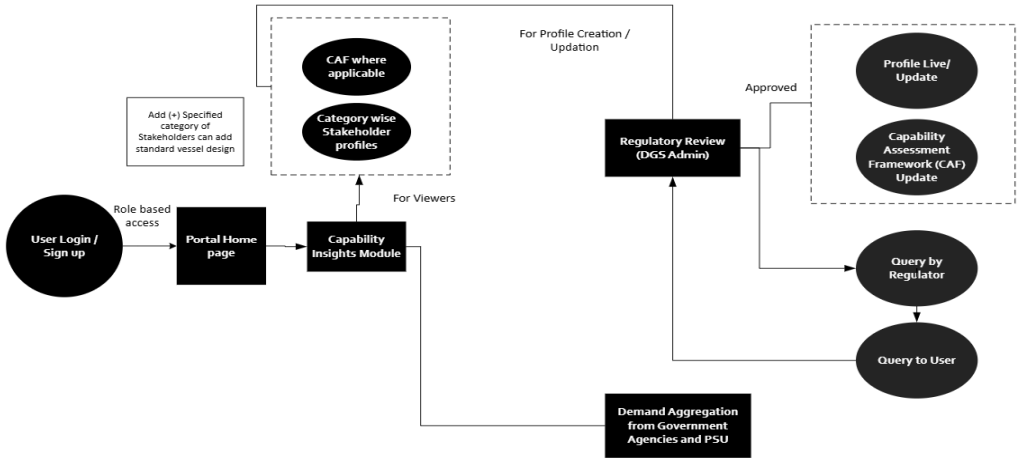

For Profile Creation / Updation
CAF where applicable
Category wise Stakeholder profiles
Add (+) Specified category of Stakeholders can add standard vessel design
Approved
Profile Live/ Update
Regulatory Review (DGS Admin)
Capability Assessment Framework (CAF) Update
For Viewers
Role based access
User Login / Sign up
Portal Home page
Capability Insights Module
Query by Regulator
Query to User
Demand Aggregation from Government Agencies and PSU

Figure 9 Process Overview of Capability Insights

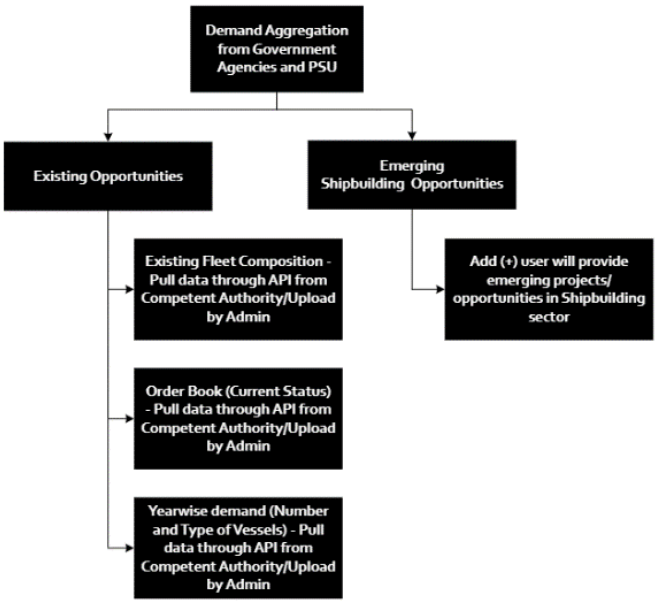

Demand Aggregation from Government Agencies and PSU
Existing Opportunities
Emerging Shipbuilding Opportunities
Existing Fleet Composition - Pull data through API from Competent Authority/Upload by Admin
Add (+) user will provide emerging projects/ opportunities in Shipbuilding sector
Order Book (Current Status) - Pull data through API from Competent Authority/Upload by Admin
Yearwise demand (Number and Type of Vessels) - Pull data through API from Competent Authority/Upload by Admin

Figure 10 Capability Insights Module Part A

The document aims at understanding the process to be followed for browsing, accessing and updating the technical documents and requirements for both FE users and BE users. These requirements are captured through a study of the business functions, discussion with relevant stakeholders and study of global practices.

3.5 Front office flow

1. Login to the application and access relevant web-form: The Front-End user will go to portal and login using applicable login procedures as described in" User Registration and Login (Front End User)". Post login the user selects 'comprehensive technical portal', selects from the menu items and selects fill applicable mandatory field to be entered.
2. Filling up the applicable field: User will fill-in the mandatory fields in the web form, provide relevant details. the user will then, click on 'Save and continue' button. Upon, clicking 'Save and Continue' button, the system will do the following:
    a. Save the information in the draft application
    b. In case the user has selected "Yes" in field 1 (a) "Whether name profile of the stakeholder is already approved by DGS admin of Companies, the system will check for:
        i. In case of errors, the system will require user to rectify the errors and click on the action button 'Save and continue' again.
        ii. In case of no errors, user will directly proceed to Step 3.

iii. In case of any errors identified basis the validation rules, the user will be required to rectify the errors and click on the action button ‘Save and continue’ again.

iv. In case no errors are identified, the user will proceed to fill the subsequent details. The information will be locked for editing.

c. After successful validation, an action button “Edit” will be displayed in enabling the user to change/edit the value. If the user clicks on “Edit” button, they will be required to click on “Save and Continue” button to proceed to subsequent blocks. All the applicable validations will be performed every time user clicks on ‘Save and Continue’ button after editing the information.

3. Uploading of the verification documents: After filling up the form, the uploading of the of the verification document will be done.
4. Submit: After the user has filled in the web-forms and clicks on the action button “Proceed to e-file” to submit the database. On clicking the action button, the details filled by the user will be auto saved and system will verify all the details basis the form validation rules and displays the following alerts, as applicable:

   a. In case there are errors, the user will be taken back to the web-form and all the relevant error messages

   b. In case there are no errors, the form will be successfully submitted.

5. SRN Generation: After successful submission, following action will be taken:
   a. The form will be submitted, and an SRN will be generated by the system. An alert message will be displayed to the user: “Your request for <Form number> has been submitted against SRN <SRN>. The filing status will be confirmed only after successful DGS admin verification.
   b. A zip file with pdf documents of the uploaded verification documents will be saved in the database.
6. Acknowledgement: After successful upload of pdf document for verification, the user will receive a system generated acknowledgement confirming the filling/ submission of the web-form. The user will also receive an email/SMS on the registered email ID/mobile number confirming submission of the application.

Resubmission of the application Profile:

In case the form is processed in non-STP mode and the BE user determines that resubmission of the original form profile is required, the Front End user will get an option to resubmit the web-

form details and provide additional details/modify entries in the form, as the case may be. We will follow the same process mentioned above for the submission and approval of form.

Alternate flow and exceptional flow are not applicable.

Other flows

1. **Profile Creation via Questionnaire:**
   - During the sign-up process, stakeholders will fill out a detailed questionnaire. Sign up process will be divided in 2 parts:
     a. Employee registration/sign up process will capture following details from the user: Full name, Designation, Organization name, Stakeholder category (via drop box), Whether authorized officer.
        The employee will then be able to participate in certain parts of the portal, that is, Questionnaire creation and answer in the public space, search and browse in technical details, industry directory, finance and insurance module.
     b. Company registration/sign up process: In the previous process the FE will select a box “whether authorized officer?”, once ticked on “Yes” option, the user will gain the access to modify the company details by answering various questions in a questionnaire. This questionnaire will capture company details and other verification document will be uploaded to the portal.
     c. After filling up the details the company profile will be created and sent to the BE user /administrator for approval. Successful approval will allow the company profile to be used for statistics data and collaboration activities.
   - The user will then be able to create research requests, collaboration requests in public as well as private groups for collaboration on sensitive projects.
     a. Once the questionnaire is completed, the information will be reviewed and approved by the DGS.
     b. After approval, a comprehensive profile of the stakeholder will be created based on the provided information.
2. **Report Functionality:**
   a. Each profile page will have a "Report" button.
   b. This feature allows users to report any discrepancies or inaccuracies they find in other stakeholders' profiles. It will also allow users to flag incorrect information and report inappropriate content, spam content. Frequent reports of similar kinds will allow the administrators or BE users to create proper community guidelines.
   c. The reported issues can then be reviewed and addressed by the administrators.

3. **Stakeholder Mapping in CAF:**
    a. Certain categories of stakeholders will be mapped in the CAF (Capability Assessment Framework).
    b. The specific details and modalities of this mapping process will be provided during the RFP (Request for Proposal) stage.
4. **Project Showcase Sub-module:**
    a. This sub-module will highlight important projects (both completed and ongoing) by each stakeholder.
    b. Stakeholders can showcase their significant projects, providing visibility and recognition.
    c. Detailed information about each project can be accessed through a URL provided by the stakeholder.

Back-office Flow – Not Applicable

4. Collaboration Hub Module Introduction

4.1 Purpose

This module provides a platform to connect the user with all the on-boarded stakeholders, regulators and also with the successfully registered and verified user in the portal including regulators with each other.

4.2 Scope

This document covers FE users and BE user functionality.

4.3 Overview

The document aims at understanding the process to be followed in collaboration Hub. These requirements are captured through detailed study of the business functions, discussion with relevant stakeholders and study of global practices.

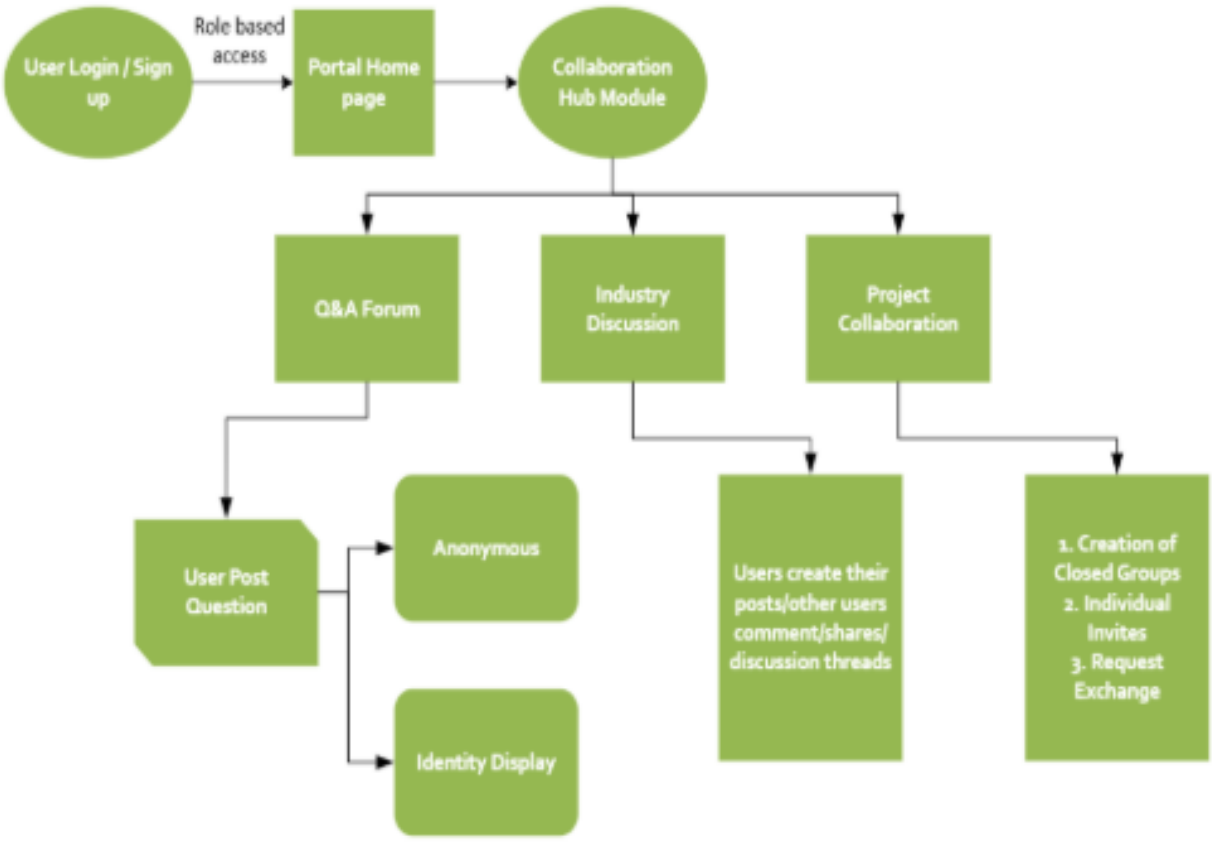


Figure 11 Collaboration Hub Module

This module will receive inputs from:

a. Home page
b. User Registration and Login (Front End User)

c. Redirected to collaboration Hub
d. Back-end verification on entered inputs

This module will provide inputs to the following modules:

a. Q&A Forum
b. Dashboard for questions and Answers
c. Creation of discussion threads among onboarded algorithm
d. Project collaboration by creation of private groups
e. Back End user verification for display in portal

4.4 My Groups Section

- Logged-in users will see a **"My Groups"** section located in the **mid-left area** of the Collaboration Hub Module.
- This section will display all groups the user is currently a member of.
- Users can interact with their groups, view group-specific updates, and access shared resources

User Characteristics

User	User Role	User Characteristics
Front End User	The registered Front End user can access the collaboration Hub for incorporation by login through the Home page and redirected to the collaboration Hub. The unregistered users will have limited access and will not be allowed to see any private groups.	— Front End users — Applicable to all the on-boarded and successfully registered stakeholders
Back End User	The Back End user processes the application and verify by the Front end user during sign up process. The BE user can also monitor discussions on the module to moderate the quality.	— Back End user — Applicable to the admin (DGS)

4.5 Process Overview

The process overview will explain the process flow functional for the collaboration hub, which comprises of three sections as Q&A Forum and Industry Discussion and Project Collaboration.

4.6 Front office flow

1. Login to the application and access relevant web-form: The FE user will go to service portal and login using applicable login procedures as described in “Module1” - User Registration and Login (FE). Post login the user selects ‘the stakeholder type from the drop-down list’, and from the menu items and selects ‘the tab which he wants to access (8 tabs).
2. Accessing the Collaboration Hub:
    - Q&A Forum: User will create posts in the collaboration Hub and will discuss the same.
    - Industry discussion: The user will create a post for discussion/information sharing and carry on in their discussion in threads.
    - Project collaboration: The stakeholders will create private groups for discussion. That group will be confidential for the only the group members only in the group and no discussed will be discussed beyond this group.
3. Acknowledgement: The user will also receive an email/SMS on the registered email ID/mobile number confirming submission on creating the post.

4.7 Back office Flow

Review of application: DGS Admin clicks on an SRN and reviews the posts based on the following information. In case of any resubmission, user will be able to view the resubmitted posts including the attachments and any change from original application will be highlighted.

Approval/Acknowledgement: Once the work item is ‘Approved’ applicable data along with the approved posts will be shared with the forum.

5. Training & Certification Module Introduction

5.1 Purpose

This module aims to provide structured information on available training programs, certifications, and skill development opportunities for the industry workforce, covering various aspects of shipbuilding, repair, safety, and environmental compliances.

5.2 Scope

This document covers FE users and BE user functionality.

5.3 Overview

This document provides a comprehensive guide on the available training programs, certifications, and skill development opportunities for the industry workforce. It details the procedures for browsing, accessing, and updating training and certification resources for both front-end (FE) and back-end (BE) users.

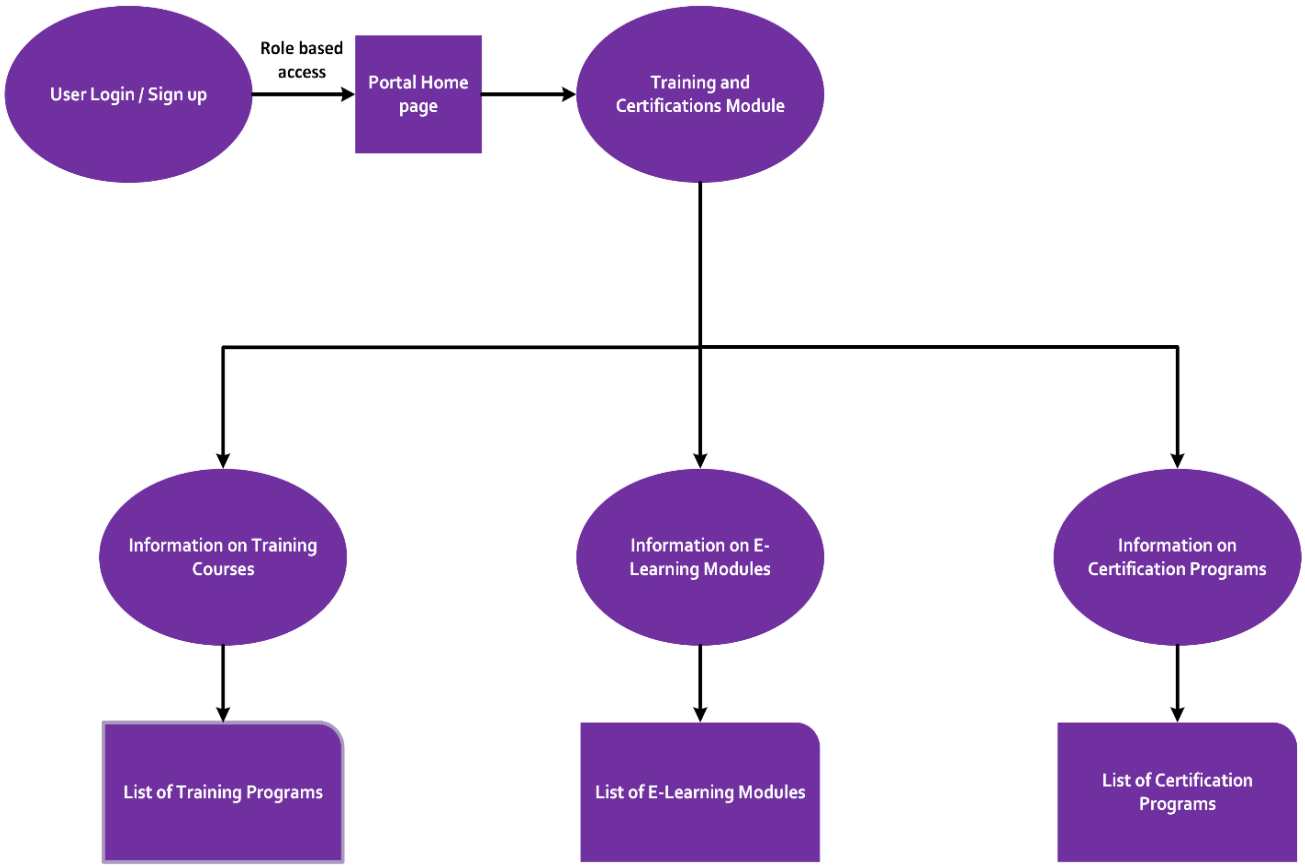


Figure 12 Training & Certifications Module

User Characteristics

User	User Role	User Characteristics
FE user	The registered FE user can browse training courses and training institutes providing specialized training and certification courses for shipbuilding and repair industry.	— Employees, trainees, professionals — Varies widely in technical proficiency — Interested in technical skills, safety protocols, regulatory compliance, and environmental sustainability
BE User	The BE user manages the training and certification resources, updates course content, manages user accounts, and generates reports.	— Administrators, training coordinators, IT support staff — Higher technical proficiency — Focused on maintaining content accuracy, system security, and user support.

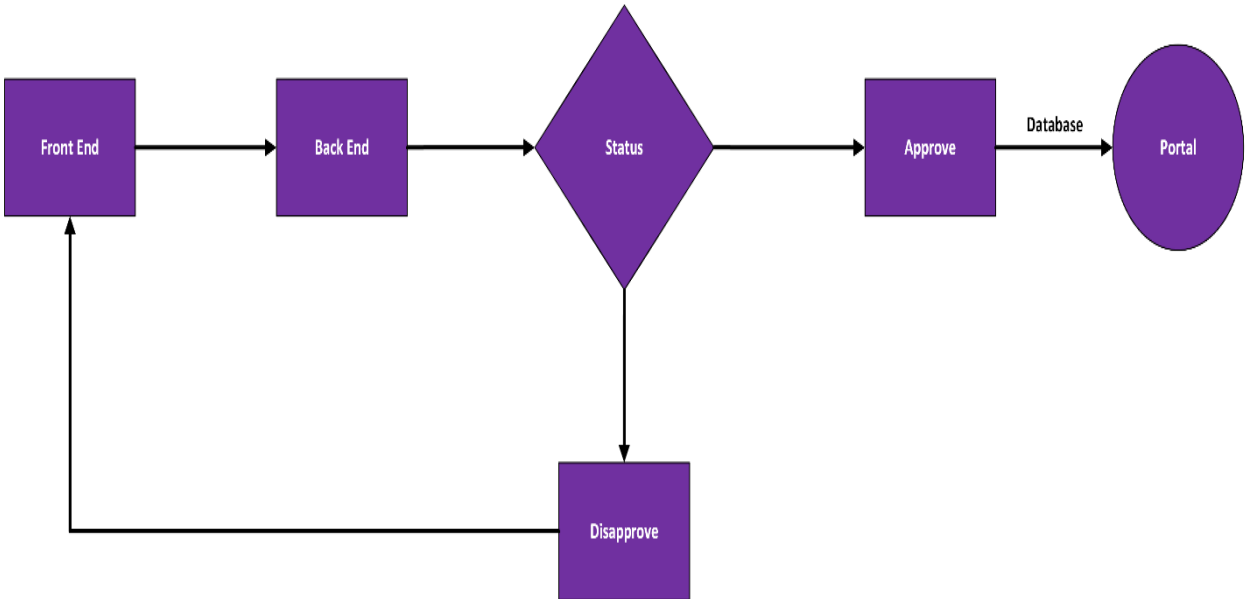


Figure 13 Use case for Training and Certification Module

Use Case Catalogue

A list of all use cases for the sub module with brief purpose description are defined in the below table.

Category	Use Case ID	Name	Interface
User Enrolment	M5-UC-001	Browse list of Training Courses	Front-End (FE)
Certification Management	M5-UC-002	Access list of Certification Programs	Front-End (FE)
Content Management	M5-UC-003	Upload list of Training Courses	Front-End (FE)
Content Management	M5-UC-004	Update/Approve Course Content	Back-End (BE)
Access Control	M5-UC-005	Restrict Access to Certain Content	Back-End (BE)
Feedback Collection	M5-UC-006	Collect User Feedback on Courses	Front-End (FE)
Training institute profile	M5-UC-007	User will be able to click on institute name to view a profile of the institute.	Front-End (FE)

5.4 Process Overview

1. This section explains the process flow pertaining to the searching and browsing of the Training and Certification Module. The user is required to follow the process which are as follows:

    a. Open Training and Certification module

    b. User navigates to the training courses section

c. System displays course categories
d. User selects a category
e. System shows courses in the selected category
f. User applies filters and sorts the courses
g. User views detailed course information.

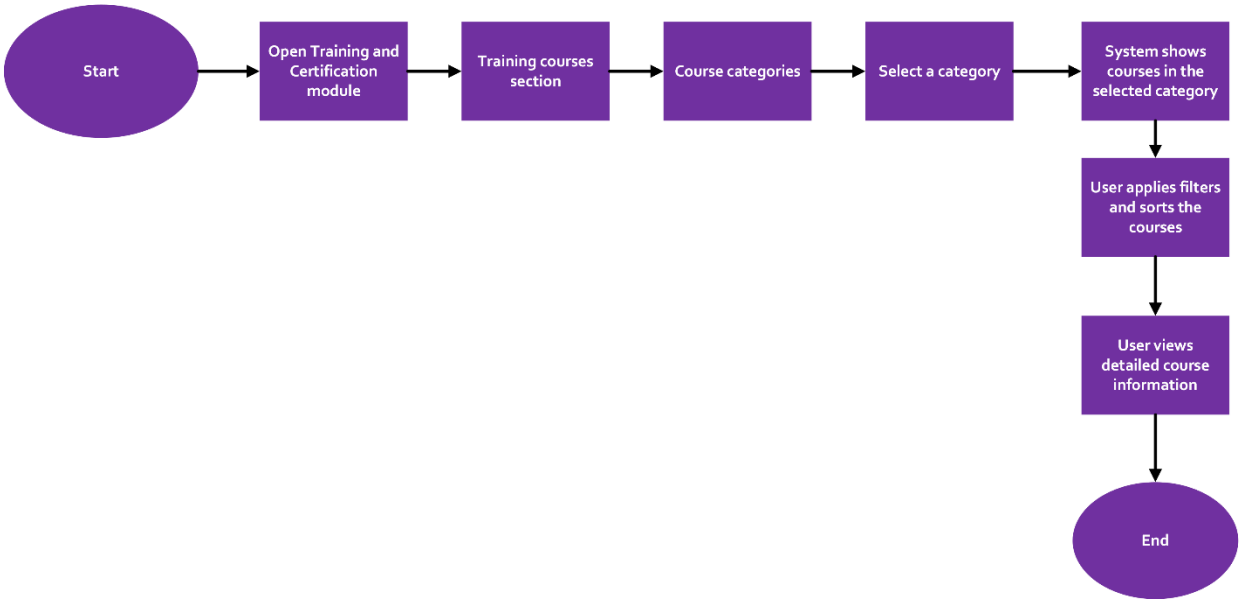


Figure 14 Process Overview for Training & Certification Module

Applicable Scenarios

Scenario ID	Scenario Name	Description
SC-001	User Login/Signup	User accesses the portal and logs in or signs up if they don't have an account.
SC-002	Navigate to Home Page	User is directed to the portal's home page after successful login/signup.
SC-003	Access Training and Certifications Module	User selects the "Training and Certifications" module from the home page.

SC-004	Browse Training Courses	User views the list of available tr aining programs.
SC-005	Browse E-Learning Modules	User views the list of available e-l earning modules.
SC-006	Browse Certification Programs	User views the list of available ce rtification programs.

Processing Type

Scenario ID	Type of Processing	Conditions (If Any)
SC-001	Authentication	User must provide valid credential s for login.
SC-002	Navigation	Successful login/signup redirects user to the home page.
SC-003	Navigation	User selects the module from the home page menu.
SC-004	Data Retrieval	System retrieves and displays the list of training programs.
SC-005	Data Retrieval	System retrieves and displays the list of e-learning modules.
SC-006	Data Retrieval	System retrieves and displays the list of certification programs.

Confidentiality

Scenario ID	Confidentiality	Conditions (If Any)
SC-001	High	User credentials must be securely handled.

SC-002	Medium	User session data should be protected.
SC-003	Medium	User navigation data should be protected.
SC-004	Low	Training course information is publicly acce ssible.
SC-005	Low	E-learning module information is publicly ac cessible.
SC-006	Low	Certification program information is publicly accessible.

Signatory Details

Scenario ID/Form	Signatory details
SC-001	User provides credentials for login/signup.
SC-002	System confirms successful login/signup.
SC-003	User selects the "Training and Certifications" module.
SC-004	System displays the list of training programs.
SC-005	System displays the list of e-learning modules.
SC-006	System displays the list of certification programs.

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5.5 Front office flow

1. **Login to the Application and Access Relevant Web-Form**

   a) The FE user navigates to the service portal and logs in using the applicable login procedures as described in “Module1” - User Registration and Login (FE).

b) Post login, the user selects the stakeholder type from the drop-down list and chooses the desired tab (out of 8 tabs) from the menu items.

2. **Accessing the Training and Certifications Module**

a) Training Courses: User views the list of available training programs.

b) E-Learning Modules: User views the list of available e-learning modules.

c) Certification Programs: User views the list of available certification programs.

3. **Browsing and Selecting Training Options**

a) Training Course Listings: User browses through the catalogue of skill enhancement programs offered by training institutes.

b) Training Institute Listings: User explores the database of institutes providing skill development courses and certification programs.

5.6 Back office Flow

Not Applicable

6. Finance & Insurance Module

6.1 Purpose

To provide a structured information on available repository of government subsidies, financial products, investment opportunities, and insurance solutions available for industry stakeholders in the shipbuilding and repair sector.

6.2 Scope

This document covers FE users and BE user functionality.

6.3 Overview

This document outlines the processes for browsing, accessing, and updating information on financial assistance, government incentive programs, and insurance solutions for the shipbuilding and repair sector in India. It aims to support industry stakeholders by providing comprehensive details on available financing options, government schemes, investment opportunities, and risk management resources. These requirements are derived from an analysis of business functions, stakeholder consultations, and a review of global best practices.

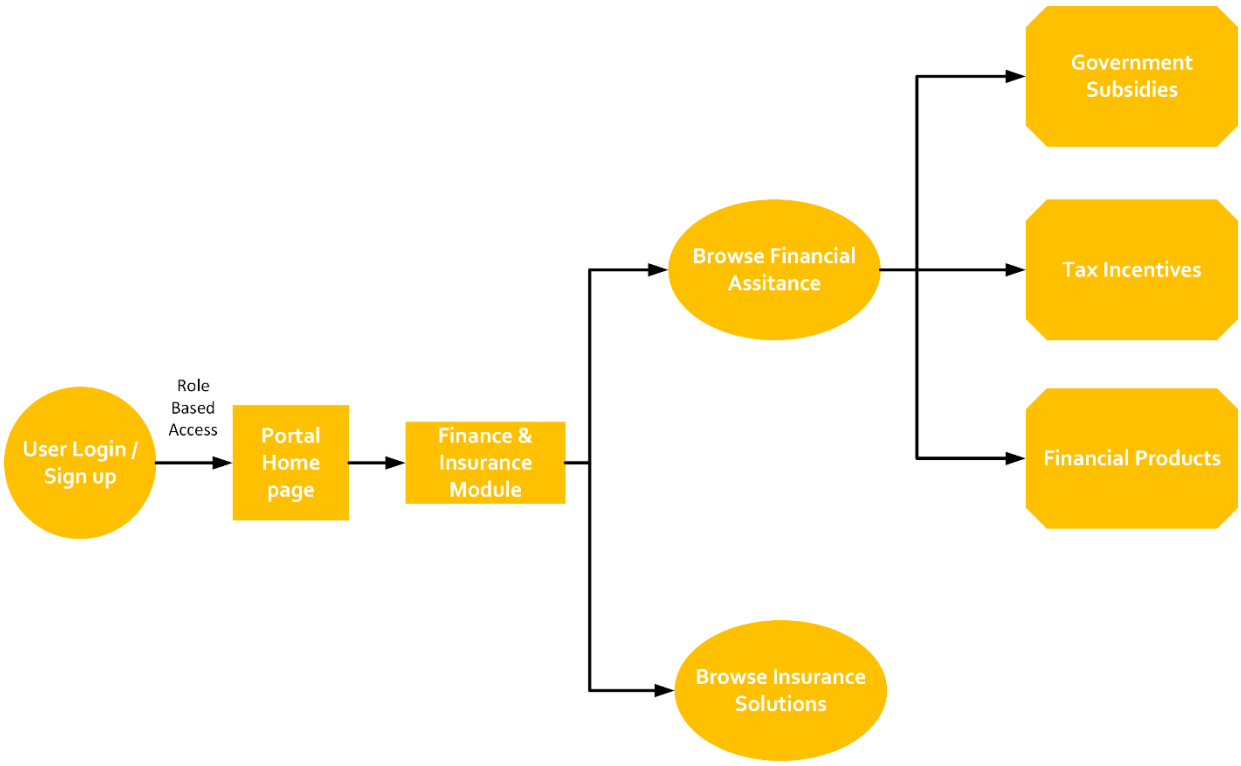

Figure 15 Finance & Insurance Module

User Characteristics

User	User Role	User Characteristics
FE User	The registered FE user can browse financial schemes and will be redirected to apply for financial assistance on SBFAP portal, access information on government schemes, and provide feedback on the module. Note: FE users in the category of govt authorities such as Maritime boards should be able to post/submit their own schemes. Alternatively, they will submit, and DGS will approve before going live on portal. Bankers and insurers should be able to submit their own loan schemes which will be displayed only after DGS approval. Stakeholders looking for finances / insurance should be able to post their requirements so that these opportunities can be viewed by financers/insurers. To be approved by DGS before going live.	— Shipyard employees, maritime professionals and other industry stakeholders — Varies widely in technical proficiency — Interested in financing options, government incentives, investment opportunities, and insurance solutions.
BE User	The BE user manages the financial assistance resources, updates information on government schemes, manages user accounts, and generates reports.	— Administrators, financial coordinators, IT support staff — Higher technical proficiency — Focused on maintaining content accuracy, system security, and user support

Use Case Catalogue

A list of all use cases for the sub module with brief purpose description are defined in the below table.

Category	Use Case ID	Name	Interface
Government Schemes	M6-UC-001	Browse Government Subsidies	Front-End (FE)
Government Schemes	M6-UC-002	Access Tax Incentives Information	Front-End (FE)
Loan & Investment Listings	M6-UC-003	Search Financial Institution Offerings	Front-End (FE)
Insurance Solutions	M6-UC-004	Browse Insurance Products	Front-End (FE)
Insurance Solutions	M6-UC-005	Upload Insurance Product Document	Front-End (FE)
Content Management	M6-UC-006	Update Government Schemes Database	Back-End (BE)
Content Management	M6-UC-007	Manage Loan, Insurance & Investment Listings	Back-End (BE)
User Management	M6-UC-008	Manage User Accounts	Back-End (BE)
Reporting	M6-UC-009	Generate Financial Assistance Reports	Back-End (BE)
Access Control	M6-UC-010	Restrict Access to Sensitive Information	Back-End (BE)
Feedback Collection	M6-UC-011	Collect User Feedback on Financial Assistance	Front-End (FE)

6.4 Process Overview

1. This use case explains the process flow pertaining to searching and browsing the Financial Assistance Module for government subsidies. The user is required to follow the following process:
    a. Open Financial Assistance Module.
    b. User navigates to the "Browse Financial Assistance" section.
    c. System displays options for financial assistance. System will get inputs from Collaboration Hub Module and investment opportunities related to projects and research activities will be displayed.
    d. User selects "Government Subsidies."
    e. System shows a list of available government subsidies.
    f. User views detailed information on selected subsidies.
    g. User reviews eligibility criteria, application procedures, and benefits.

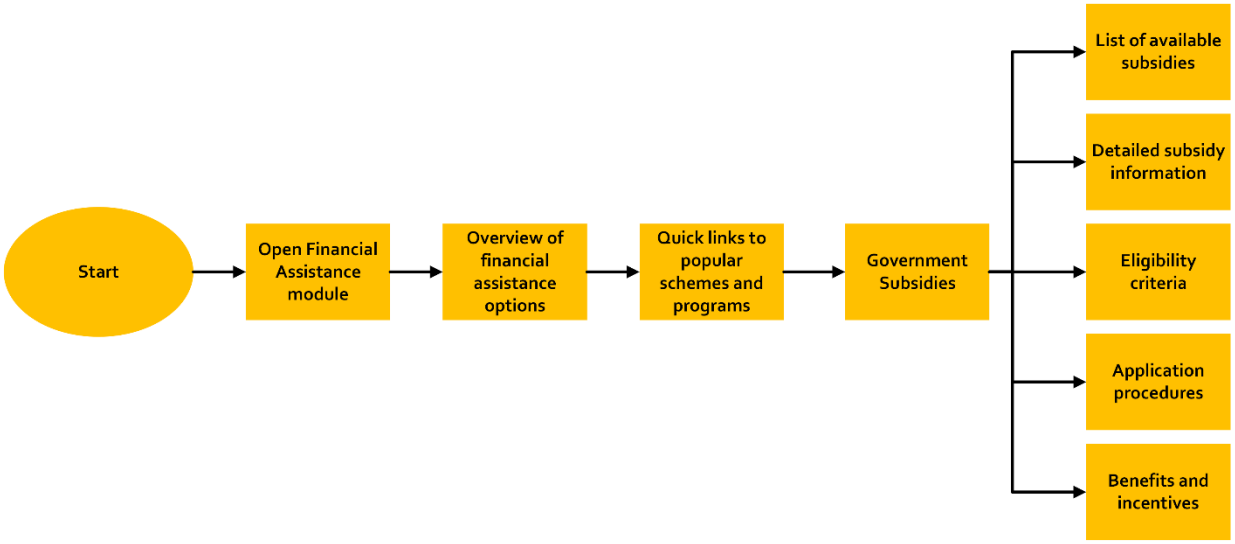

Figure 16 Process Overview for Finance & Insurance Module

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6.5 Front office flow

1. Login to the Application and Access Relevant Web-Form

    a) The FE user navigates to the service portal and logs in using the applicable login procedures as described in “Module1” - User Registration and Login (FE).

b) Post login, the user selects the stakeholder type from the drop-down list and chooses the desired tab (out of 8 tabs) from the menu items.

2. Accessing the Financial Assistance Module

    a) Government Subsidies: User views the list of available government subsidies.

    b) Tax Incentives: User views the list of available tax incentives.

    c) Financial Products: User views the list of available financial products.

3. Browsing and Selecting Financial Assistance Options

    a) Government Subsidies: User browses through the list of available subsidies and views detailed information.

    b) Tax Incentives: User explores the available tax incentives and eligibility criteria.

    c) Financial Schemes: User searches for financial schemes offered by institutions and views detailed information

    d) Financial Products:

4. Acknowledgement

    a) The user receives an email/SMS on the registered email ID/mobile number confirming the selection or application for a government subsidy, tax incentive, or financial product.

6.6 Back office Flow

Not Applicable.

7. Innovation Centre Module

7.1 Purpose

This module aims to simplify the access to all the innovation centre related to the shipbuilding and ship repair industry.

7.2 Scope

This document covers FE users and BE user functionality.

7.3 Overview

The document aims at understanding the process to be followed for browsing, accessing and updating the projects in the innovation centre.

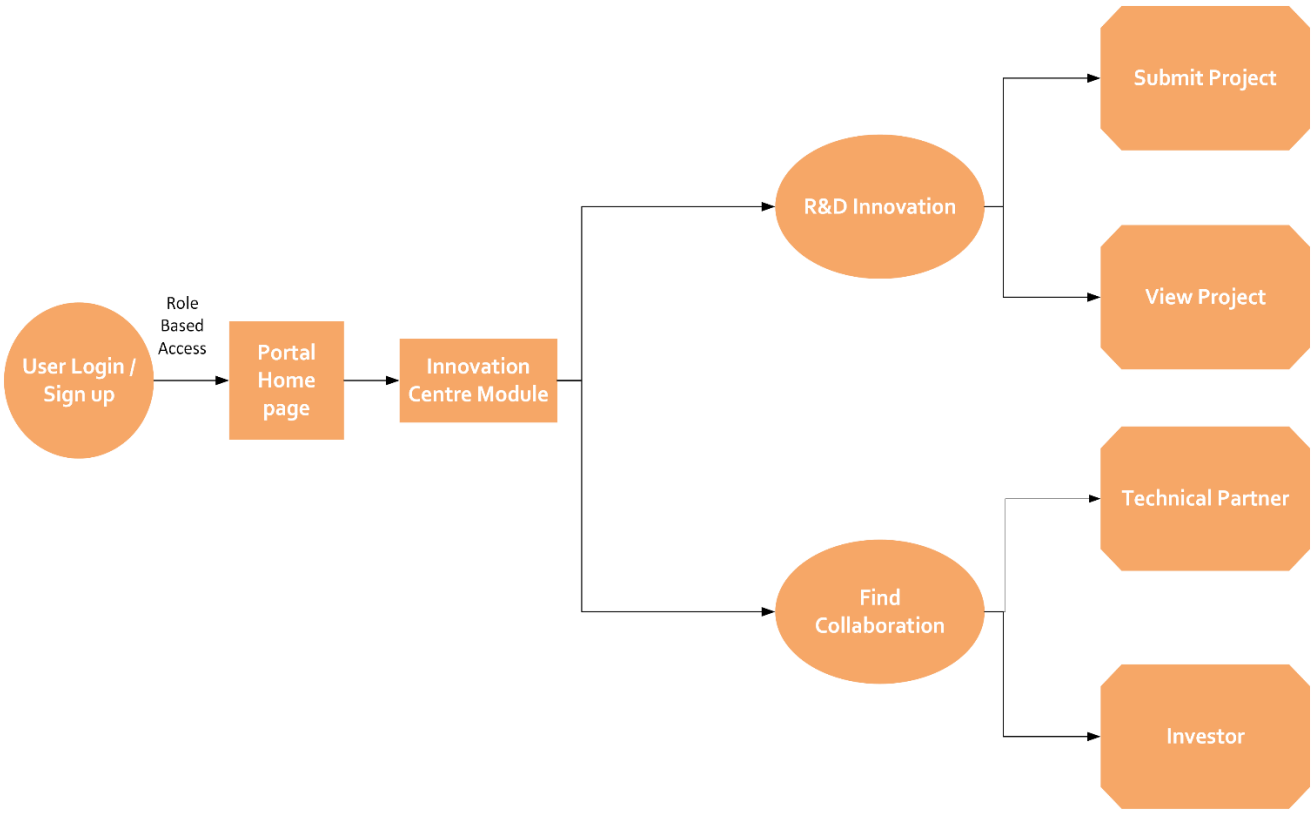

Figure 17 Innovation Centre Module

User Characteristics

User	User Role	User Characteristics
FE user	The registered FE user can browse Innovation centre.	— FE users — Medium Computer Literate — Knowledge of Naval engineering, generalists etc.
BE User	The BE user processes the data, documents updated by the FE user. The BE user can also restrict access to certain documents if necessary.	— DGS Users — Medium Computer Literate — Naval Architectures, Engineers, Designers.

7.4 Process Overview

This module will provide users with information about new technologies and research work related to the shipbuilding and ship repair industry. Users will have access to information on their organization's new technology trends and research work from various institutions.
Additionally, users can upload new research work and research papers they have published on any recognized platform. Each document uploaded must include the identity of the publishing house, institution, or patent recognition. User Identity will be disclosed in each upload.

7.5 Front office flow

Search and/or browse the database: The FE user will click on the search bar of the innovation centre module and enter information that he/she needs to search. The database will be queried for the input and relevant results will be pulled from the database and published in the form of pagination. A user can select the number of results that he/she can see i.e. 10,25,50 in one page. Results more than the selected number be shown in the next page and so on.

Research categories: The FE user will see many boxes based on the research categories. These research categories will be uploaded via BE user and one box will point towards new and exciting research being done by particular research and innovation centres all over the

country. Categories like green technologies, battery, fuelling advanced automation will be covered here. List of research institutes will also be mentioned.

Uploading the documents: Users can upload any document, research work, white paper, or thesis, along with all publication details and the recognized platform, with their identity disclosed.

7.6 Back office Flow

The BE user will create and post lists of research and innovation on the Front End of this module. He/she will be able to update, modify and delete the lists. BE user will also browse the successful testimonies posted on collaboration hub and post it as reading material for this module.

8. Technical Library Module

8.1 Purpose

This module aims to simplify the access to all the technical information related to the shipbuilding and ship repair industry. The library will become a central repository for all the technical information that FE users can see anytime. Any information that has to be updated will have to be done through the BE users.

8.2 Scope

This document covers FE users and BE user functionality of the Technical Library module.

8.3 Overview

The document aims at understanding the process to be followed for browsing, accessing and updating the technical documents and requirements for both FE users and BE users. These requirements are captured through a study of the business functions, discussion with relevant stakeholders and study of global practices.This module will provide user the functionality to add

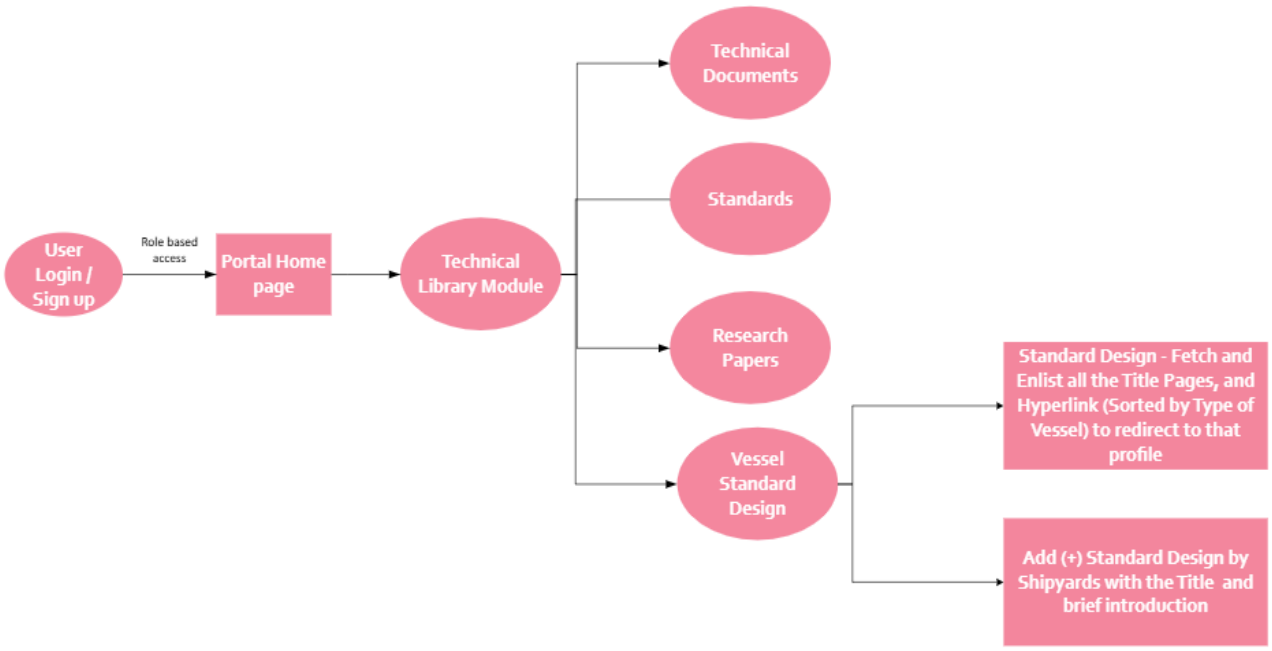
User Login / Sign up
Role based access
Portal Home page
Technical Library Module
Technical Documents
Standards
Research Papers
Vessel Standard Design
Standard Design - Fetch and Enlist all the Title Pages, and Hyperlink (Sorted by Type of Vessel) to redirect to that profile
Add (+) Standard Design by Shipyards with the Title and brief introduction

Figure 18 Technical Library Module

Vessel standard design from shipyard in a tab and then link the same to the profile uploaded in the profile creation into the field along with that it will also enlist standard vessel design provided by shipyard during profile creation by the shipyard.

User Characteristics

User	User Role	User Characteristics
FE user	The registered FE user can browse technical documents in the library. User can also upload and request certain kinds of documents on behalf of the stakeholder, shipyards etc.	— FE users — Medium Computer Literate — Knowledge of Naval engineering, generalists etc.
BE User	The BE user processes the data, documents updated by the FE user. The BE user can also restrict access to certain documents if necessary.	— DGS Users — Medium Computer Literate — Naval Architectures, Engineers, Designers.

Use Case Catalogue

A list of all use cases for the sub module with brief purpose description are defined in the below table.

Category	Use Case ID	Name	Interface
Create and submission			
Search/Browsing technical library	M8-UC001	Integrated Technical library search Application	Web (Responsive)
Uploading new technical documents	M8-UC002	Integrated Technical library upload Application	Web (Responsive)

Submitting reports for outdated technical document	M8-UC003	Integrated Technical library report Application	Web (Responsive)
Approving the new technical documents/deleting the old technical documents	M8-UC004	Integrated Technical library update Application	Web (Responsive)
Sending messages to authors and owners of documents for updating the old technical documents	M8-UC005	Integrated Technical library message Application	Web (Responsive)

8.4 Process Overview

The document aims at assisting in understanding the process to be followed for browsing, accessing and updating the technical documents and requirements for both FE users and BE users. These requirements are captured through a study of the business functions, discussion with relevant stakeholders and study of global practices.

This use case explains the process flow pertaining to the searching and browsing the technical library. The user is required to follow the process which are as follows:

a. Open Technical library module
b. Click on the search bar and input data.
c. The search request will go to the technical database and come up with the results.
d. The result will be shown to the user.
e. Users click the file and previews the file.

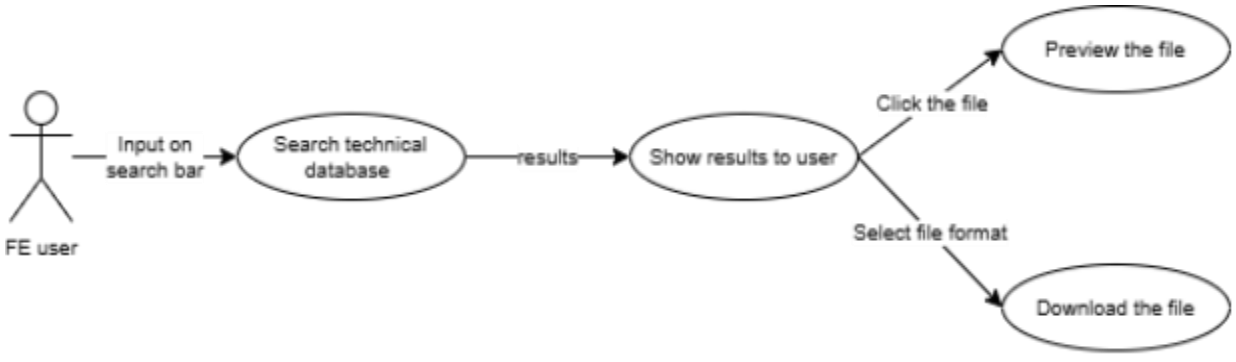

Figure 19 Process overview for Technical Library Module

8.5 Front office flow

1. **Search and/or browse the database:** The FE user will click on the search bar of the technical library module and enter information that he/she needs to search. The database will be queried for the input and relevant results will be pulled from the database and published in the form of pagination. A user can select the number of results that he/she can see i.e. 10,25,50 in one page. Results more than the selected number be shown in the next page and so on.
2. **Selection of a result:** User will select the relevant results.
    a. User can then choose either to preview the selected results in new tabs or choose to download the allowable content in the format of their choosing.
        - Allow user to choose between pdf and excel format.
    a. A document downloaded, visited and read count will be generated and stored in the database and posted above the document. This data will be sent to the statistics page later.
    b. The author of the document will be sent the usage statistics of their content. Every author/organization will be given “Most viewed” tag in their topic based on the content views.
3. **Request permission for restricted documents:** After successfully loading results from the database, the user will be able to see what file are available for him to see and what files are restricted. If some file is available for this role, then the user will be able to see the file. If a file is not permitted for that role, then user must click a button to request permission to see the file. Once a permission is requested the request will go to a back-end user and the owner of the document. Only when the permission is given by both BE user and author then the user will be able to see a file.

    Author:

    - Author will open his/her tab to see what documents are uploaded and regularly check to see if the view/download restrictions have to be changed.
    - Once a document is uploaded by an author then the document will become restricted and only through permission will it become visible to the public.
    - Author will open a permissions request tab to check when they receive view/download request for the restricted document. Once risk is assessed the author may change the permission for that particular user. Other users who didn’t request the permission will not be able to see the document.

4. Approving the permissions for view/download status of the documents: After successfully uploading all the document by BE user or authors all new documents will need to receive a view/download permission from the BE user:
    a. BE user can approve the view permission as “Public” if the authors have given the “Public” view permission to the document.
    b. BE user can approve the view permission as “Restricted” if the authors of the document have given the permission as “Restricted” to the document when it was requested by the FE user. That document will only be visible to the person who requested the permission to view/download the document.
    c. BE user can approve/disapprove the view permission and send a message of approval or disapproval. Concerned author and FE user may then change the request and resubmit the request for approval.
    d. BE user may also review the status of periodically updated documents and send the update request to the authors.
    e. Authors may then update the document and sent the status of the document to BE user.
    f. FE user may send a request to update certain documents based on the periodicity, policy changes or technically updated details. Same request will be sent to the author and BE user. Author and BE user can respond with a specific time to update the document.
5. Accessing the Application Dashboard: User will fill up and submit the aforementioned forms pursuant to which the following Application Dashboard will be visible to the respective user:

Request application for BE user

Request application for BE user				
#	Document	Requested Status	Last Modified Date	Send to Author
1	Document 1	Public		Author 1
2	Document 2	Private		Author 2
3	Document 2	Restricted		Author 3
4	Document 4	Under process		Author 4

Request application for Author				
#	Document	Requested Status	Last Modified Date	Send to FE user
1	Document 1	Public		BE User
2	Document 2	Private		User 2
3	Document 2	Restricted		User 3

8.6 Back-office Flow

Back office:

1. The BE user will receive lots of permission under the technical library permissions tab.
2. BE user will review the view/download request and assess the risks and safety related to the document. If deemed risk free, then the BE user can grant view/download permission.

9. Regulatory & Compliance Module

9.1 Purpose

This module aims to simplify the access to all the technical information related to the shipbuilding and ship repair industry.

9.2 Scope

This document covers FE users and BE user functionality.

9.3 Overview

The document aims at understanding the process to be followed for browsing, accessing and updating the regulatory and bodies and compliance requirements for both FE users and BE users. These requirements are captured through a study of the business functions, discussion with relevant stakeholders and study of global practices.

It will provide user information about the four pillar Indian shipbuilding enhancement strategy which consists on information on SBFAS, credit note scheme, MDF(maritime Development Fund),capability and capacity, legal ,policy and process reforms.

User Characteristics

User	User Role	User Characteristics
FE user	The Front End user will enter their query	Front End User Stakeholders registered in the portal Regulators who are verified and registered in the portal
BE User	The Back End use approve the query to be sent to the regulators	Back End user will approve and verify the query posted by User

9.4 Process Overview

The document aims at assisting the users to connect with government regulators and class societies in India. All details related to government policies and schemes will also be published for the stakeholders.

This use case explains the process flow pertaining to regulatory and compliance

a. Login database – mandatory in all cases.
b. Query filled database- Query needs to be filled by the Front End user.

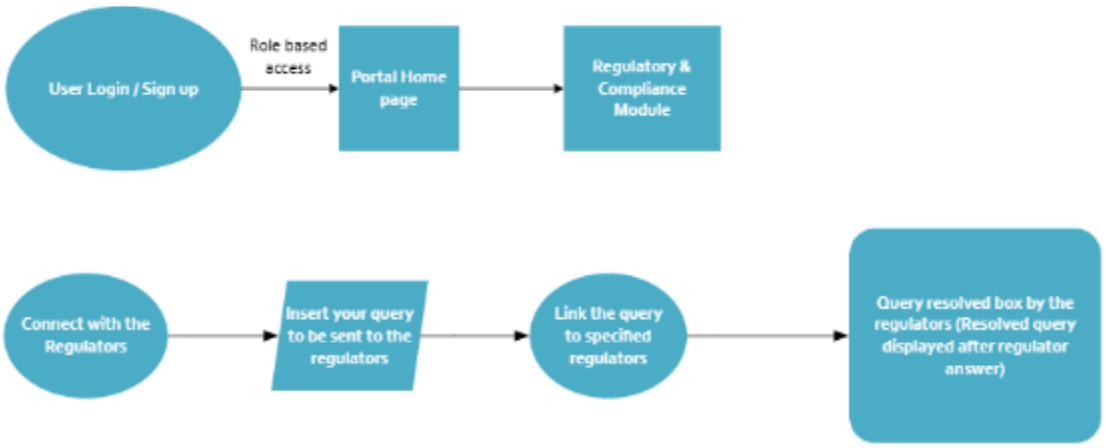
User Login / Sign up
Role based access
Portal Home page
Regulatory & Compliance Module
Connect with the Regulators
Insert your query to be sent to the regulators
Link the query to specified regulators
Query resolved box by the regulators (Resolved query displayed after regulator answer)

Figure 20 Process overview for Regulatory & Compliance Module

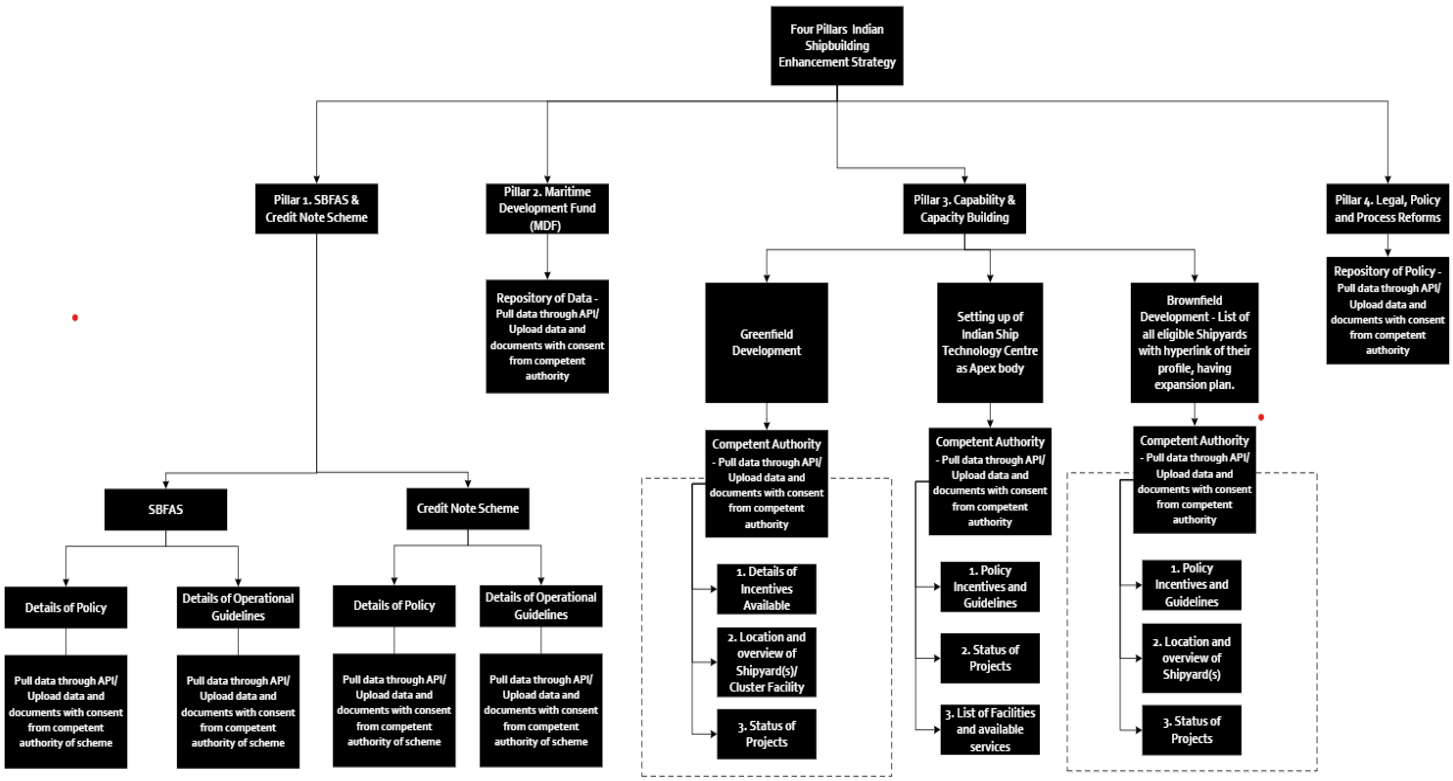
Four Pillars Indian Shipbuilding Enhancement Strategy
Pillar 1. SBFAS & Credit Note Scheme
Pillar 2. Maritime Development Fund (MDF)
Pillar 3. Capability & Capacity Building
Pillar 4. Legal, Policy and Process Reforms
Repository of Data - Pull data through API/ Upload data and documents with consent from competent authority
Greenfield Development
Setting up of Indian Ship Technology Centre as Apex body
Brownfield Development - List of all eligible Shipyards with hyperlink of their profile, having expansion plan.
Repository of Policy - Pull data through API/ Upload data and documents with consent from competent authority
SBFAS
Credit Note Scheme
Competent Authority - Pull data through API/ Upload data and documents with consent from competent authority
Competent Authority - Pull data through API/ Upload data and documents with consent from competent authority
Competent Authority - Pull data through API/ Upload data and documents with consent from competent authority
Details of Policy
Details of Operational Guidelines
Details of Policy
Details of Operational Guidelines
1. Details of Incentives Available
2. Location and overview of Shipyard(s)/ Cluster Facility
3. Status of Projects
1. Policy Incentives and Guidelines
2. Status of Projects
3. List of Facilities and available services
1. Policy Incentives and Guidelines
2. Location and overview of Shipyard(s)
3. Status of Projects
Pull data through API/ Upload data and documents with consent from competent authority of scheme
Pull data through API/ Upload data and documents with consent from competent authority of scheme
Pull data through API/ Upload data and documents with consent from competent authority of scheme
Pull data through API/ Upload data and documents with consent from competent authority of scheme

Figure 21 Four Pillars Indian Shipbuilding Enhancement Strategy

9.5 Front office flow

1. Search and/or browse the database: The FE user will click on the search bar of the Regulatory and compliance module and enter the details he/she needs.
2. Details related to the government regulatory bodies and contact details will be available for the user to access.
3. Details and contact information related to the classification societies will also be present.
4. Details related to government schemes and policies will also be available for the stakeholders.
5. Details and information related to status of project, greenfield and brownfield project, location and overview of shipyards

9.6 Back-office Flow

1. BE user will be able to upload/modify the details related to the government regulators, Classification societies, policies and schemes.

10. Industry Directory Module Introduction

10.1 Purpose

To maintain a comprehensive list of shipbuilding and ship repair stakeholders, enabling better networking and business matchmaking.

10.2 Scope

This document covers FE users and BE user functionality of the Industry Directory module.
The Industry Directory Module covers a wide range of stakeholders in the shipbuilding and repair sector, including companies, suppliers, service providers, consultants, and regulatory agencies. It is designed to facilitate easy access to contact information and promote collaboration within the industry. The module includes features for searching and categorizing stakeholders, as well as integrating communication tools for seamless interaction.

10.3 Overview

This document outlines the processes for browsing, accessing, and updating the Industry Directory Module. It aims to support industry stakeholders by providing a comprehensive directory of shipbuilding and repair companies, suppliers, service providers, consultants, and regulatory agencies. These requirements are derived from an analysis of business functions, stakeholder consultations, and a review of global best practices.
This module will receive inputs from:
User registration module.

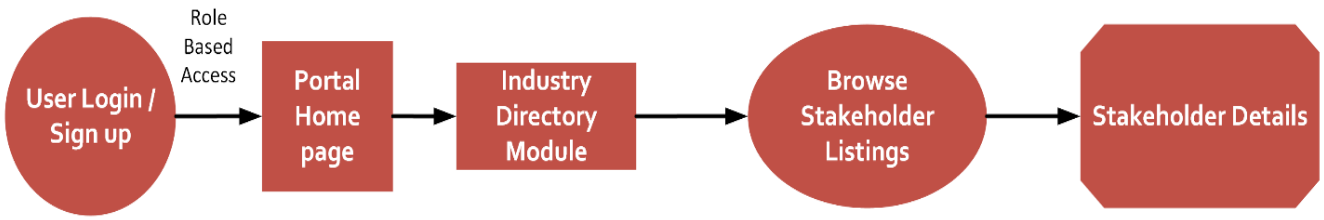

Figure 22 Industry Directory Module

User Characteristics

User	User Role	User Characteristics
FE User	The registered FE user can browse and search for stakeholders, view contact information, and initiate communication through in-platform messaging.	— Shipyard employees, maritime professionals, industry stakeholders — Varies widely in technical proficiency — Interested in financing options, government incentives, and investment opportunities
BE User	The BE user manages the directory, updates stakeholder information, manages user accounts, and generates reports.	— Administrators, Coordinators, IT support staff — Higher technical proficiency — Focused on maintaining content accuracy, system security, and user support

Use Case Catalogue

A list of all use cases for the sub module with brief purpose description are defined in the below table.

Category	Use Case ID	Name	Interface
Stakeholder Listings	M10-UC-001	Browse Stakeholder Listings	Front-End (FE)
Stakeholder Listings	M10-UC-002	Search Stakeholder Listings	Front-End (FE)
Communication	M10-UC-003	Initiate In-Platform Messaging	Front-End (FE)
Content Management	M10-UC-004	Update Stakeholder Information	Back-End (BE)
User Management	M10-UC-005	Manage User Accounts	Back-End (BE)

Reporting	M10-UC-006	Generate Directory Reports	Back-End (BE)
Access Control	M10-UC-007	Restrict Access to Sensitive Info rmation	Back-End (BE)
Feedback Collection	M10-UC-008	Collect User Feedback on Direct ory	Front-End (FE)

10.4 Process Overview

This use case explains the process flow pertaining to searching and browsing the Industry Directory Module for stakeholders. The user is required to follow the below-mentioned process:

a) Open Industry Directory Module.

b) User navigates to the "Browse Stakeholder Listings" section.

c) System displays options for stakeholder categories.

d) User selects a specific category (e.g., shipbuilding companies, suppliers).

e) System shows a list of available stakeholders in the selected category.

f) User views detailed information on selected stakeholders.

g) User reviews contact information and initiates in-platform messaging if needed.

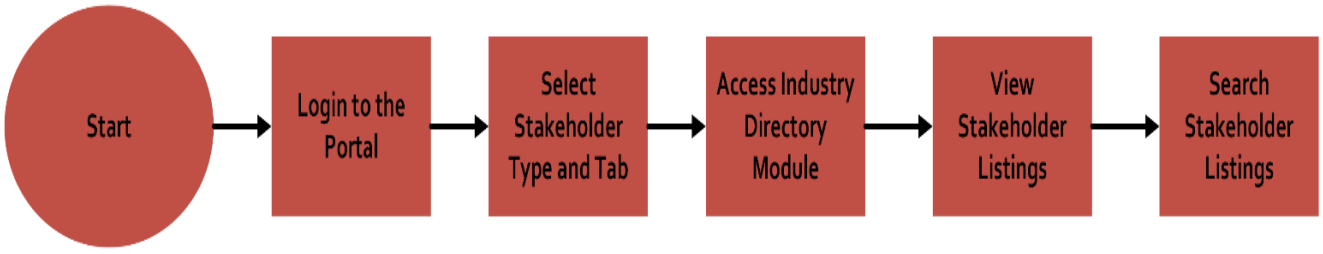

Figure 23 Process Overview for Industry Directory Module

Applicable Scenarios

Scenario ID	Scenario Name	Description

SC-001	Browse Stakeholder Listings	Users search and view available stakeholders in the directory.
SC-002	Search Stakeholder Listings	Users search for specific stakeholders using filters and keywords.
SC-003	Initiate In-Platform Messaging	Users initiate communication with stakeholders through in-platform messaging.
SC-004	Update Stakeholder Information	Admins update the directory with new or revised stakeholder information.
SC-005	Manage User Accounts	Admins create, update, and delete user accounts.
SC-006	Generate Directory Reports	Admins generate reports on directory usage and trends.
SC-007	Restrict Access	Admins restrict access to sensitive stakeholder information.
SC-008	Collect User Feedback	Users provide feedback on the directory module and its resources.

Processing Type

Scenario ID	Type of Processing	Conditions (If Any)
SC-001	Data Retrieval	User must be authenticated.
SC-002	Data Retrieval	User must be authenticated.
SC-003	Data Submission	User must be authenticated.
SC-004	Data Update	Admin privileges required.
SC-005	Data Management	Admin privileges required.

SC-006	Data Analysis	Admin privileges required.
SC-007	Access Control	Admin privileges required.
SC-008	Data Collection	User feedback is voluntary.

Confidentiality

Scenario ID	Confidentiality	Conditions (If Any)
SC-001	Public	None
SC-002	Public	None
SC-003	Confidential	User data must be protected.
SC-004	Confidential	Admin data must be protected.
SC-005	Confidential	User and admin data must be protected.
SC-006	Confidential	Report data must be protected.
SC-007	Confidential	Sensitive information must be protected.
SC-008	Public	Feedback data is anonymized.

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10.5 Front office flow

1. **Login to the Application and Access Relevant Web-Form**

    a. The FE user navigates to the service portal and logs in using the applicable login procedures as described in “Module1” - User Registration and Login (FE).

    b. Post login, the user selects the stakeholder type from the drop-down list and chooses the desired tab (out of 8 tabs) from the menu items.

2. **Accessing the Industry Directory Module**

    a. Stakeholder Listings: User views the list of available stakeholders.

    b. Search Stakeholder Listings: User searches for specific stakeholders using filters and keywords.

c. Initiate In-Platform Messaging: User initiates communication with stakeholders through in-platform messaging.

3. **Browsing and Selecting Stakeholder Options**

   a. Stakeholder Listings: User browses through the list of available stakeholders and views detailed information.

   b. Search Stakeholder Listings: User explores the available stakeholders using search filters and keywords.

   c. Initiate In-Platform Messaging: User searches for stakeholders and initiates communication through the platform.

4. **Acknowledgement**

   a. The user receives an email/SMS on the registered email ID/mobile number confirming the initiation of communication or any updates made to the stakeholder information.

10.6 Back office Flow

Not Applicable

11. Brochure Module Introduction

11.1 Purpose

This module aims to simplify the creation of Brochure process.

11.2 Scope

This document covers FE users and BE users functionality.

11.3 Overview

The document aims at assisting in understanding the process to be followed for browsing, accessing and updating the brochure.

11.4 Process Overview

The document aims at assisting in understanding the process to be followed for creating and downloading the brochure.

11.5 Front office flow

1. The FE user will go to the Brochure tab and click a button “Download latest Brochure for the Shipbuilding industry” and output will be in PDF format.
2. The File will be named “Brochure Indian Shipbuilding Industry <YYYY>” with current year added.
3. The brochure module functionality will have two sections that is one section will be a common Indian shipbuilding scenario (including text and images) that will feature by fetching specified fields from the database of the portal and second section will be only for the user who have provided their full profile information then will be printed in PDF format.

11.6 Back office Flow

1. The Backend user will update the following items:
    a. Message from Hon’ble Minister of MOPSW – Updated name, photo, message
    b. Message from Directorate General – Updated name, photo, message
    c. Photos of the latest development as uploaded by various stakeholders in their own profiles.
    d. Logos of Major companies having a significant role in the shipping industry.
    e. Industry statistics – as provided in the collaboration hub module
    f. Contact information of designated officers from DGS
2. The user will update the above information and generate preview of brochure in pdf format.

12. Admin Dashboard

12.1 Purpose

This module aims to simplify the work of administrator.

12.2 Scope

This document covers BE users functionality.

12.3 Overview

The document aims at assisting in understanding the process to be followed for browsing, accessing and updating the admin dashboard.
Additionally the admin dashboard will have the functionality to show portal KPIs, the details of which will be firmed up b y the system integrator in consultation with PMCC(Project Monitoring and Control Committee)

12.4 Process Overview

The document aims at assisting the administrator in back end functions.

12.5 Front office flow

1. Report Management Tab

This tab will enable administrators to manage user-submitted reports related to issues such as spam, profile discrepancies, and inappropriate content. Admins will be able to review, categorize, and take action on reported items, ensuring timely resolution and maintaining platform integrity.

2. Report Analytics Dashboard

A dedicated analytics interface will provide visual insights into reporting trends, frequently flagged profiles, and recurring issues. This will help administrators identify patterns, assess community health, and inform the development of platform guidelines and policies.

3. Operational Support Tab

If user demand increases, this tab will be introduced to manage service requests, stakeholder requests, and other operational concerns. It will include basic ticketing, tracking, and escalation workflows to streamline support operations.

4. Administrator Dashboard – Document Uploads Management

The Administrator Dashboard will include a dedicated interface for managing and reviewing uploaded documents across the portal. This feature will be presented as a structured Uploads List, allowing administrators to monitor submissions efficiently.

The Uploads List will be displayed in a tabular format with the following columns:

- Organization – Name of the organization that submitted the document.
- Author Name – Name of the individual responsible for the document.
- Date of Upload – The date on which the document was uploaded to the portal.
- Document Valid Until – The expiration or validity date of the document, if applicable.

This functionality will support administrative oversight, compliance tracking, and timely follow-up on document renewals or updates. It will also enable filtering, sorting, and export capabilities to assist with reporting and audits.

5. Administrator Dashboard – User Activity Lookup

The Administrator Dashboard will include a feature that allows administrators to search and review the complete activity history of any registered user. By entering a User ID, admins can retrieve a detailed log of the user's interactions within the portal.

This functionality will support:

- Oversight of industry participants and their engagement with various modules.
- Audit and compliance tracking by providing visibility into user actions.
- Behavioral analysis to identify usage patterns or anomalies.
- The activity history will include timestamps, module interactions, and key actions performed, ensuring transparency and accountability across the platform.

13. Internal Statistics Page and SLA monitoring page

13.1 Purpose

This module aims to collect all the necessary statistics in two pages/windows.

13.2 Scope

This document covers BE users functionality.

13.3 Overview

The document aims at assisting in understanding the metrics to be considered for the statistics page.

13.4 Process Overview

The document aims at assisting the administrator to understand the usage of the website.

13.5 Front office flow

The portal will include a comprehensive SLA Monitoring Statistics page and Internal Statistics Page designed to provide administrators with real-time and historical insights across key operational and engagement metrics. This page will consolidate data from various functional areas to support performance tracking, user engagement analysis, and strategic decision-making.

SLA Monitoring Statistics Page		
Category	**Metric**	**Description**
System Health & Performance Monitoring	Monitor uptime and performance	Portal uptime, Avg. page load time, API response time, Data processing speed
System Health & Performance Monitoring	Track system errors	Error rate
System Health & Performance Monitoring	Monitor security	Cybersecurity incidents
Availability	CPSBR Portal Availability	
Availability	Helpdesk & Grievance Redressal Availability	

Performance	CPMS Portal Response Time	
Performance	Document Submission Performance	
Performance	Search & Query Response Time	
Application Support	Severity 1 Incident Resolution	
Application Support	Severity 2 Incident Resolution	
Application Support	Severity 3 Incident Resolution	
Application Support	Low Impact Incident Resolution	
Other Services	Feature Modification Requests	
Other Services	Change Requests Implementation	
Other Services	SOP Adherence	
Cybersecurity	Critical Incident Resolution	
Cybersecurity	Incident Report Submission	
Helpdesk	Email & Ticket Assignment	
Helpdesk	L1 Support Resolution	
Helpdesk	L2 Support Resolution	

Other metrics are covered in the DPR chapter 13.1

Reporting & Support Operations

These features are accessible via the Administrator Dashboard and Report Tab:

- Report Management Tab: Handles user-submitted reports such as spam or profile issues.

- Report Analytics Dashboard: Provides visual insights into reporting trends and flagged profiles.

Report generation button: - admin will be able to create, generate and download reports which will contain all the KPIs mentioned above.

This statistics and reporting framework ensures that administrators have a unified view of portal performance, user behaviour, and operational health, enabling proactive management and continuous improvement.

14. Work item status

Sl #	Status	Reviewer/User	Description	Visibility	Post condition output
1	Draft/Pending submission	FE User	Draft of the web-from is saved till the time SRN is generated	FE User	The details entered by the user in the form are saved in draft and available to user for further use. Any previously saved information is over-written with new values, every time a user Saves the web-form.
2	Under processing – DH queue	BE user	Once the Acknowledgement is generated for FE user and the form is added to the respective queue but not yet assigned to any DH user. Status of work item in case a work item is marked by AO as “Send back to previous user”.	BE User	Not applicable
3	Under processing with <DH>	BE user	Once the work-item is assigned to a DH user and is awaiting action from that user.	BE User	Form/Application is assigned to the Dealing hand for his review and action.
4	Under processing – AO queue	BE user	Once the DH user has forwarded the work item to AO, but AO user is yet to fetch the work item.	BE User	Not applicable

5	Under processing with <AO>	Authorizing officer	Once the work-item is assigned to an AO, post review by DH user and is awaiting action from that user.	BE user	Form/Application is assigned to the AO for his review and action.
6	Resubmission Required	FE Business user	Once the AO user reviews the form and confirm recommended action as "Send for resubmission"	FE and BE	An email/SMS notification (as applicable) will be sent to the FO user
7	Rejected	BE user	When the filled application is rejected from the Authorization officer	FE and BE	Generate an Application Rejection message. Stores the documents in the electronic repository. Send email / SMS notifications
8	Approved	BE user	This is the status when the filling in the applicable field is approved by the DGS admin		Generate an Application approval message. Stores the documents in the electronic repository. Send email / SMS notifications

15. API Integration

As the portal is envisioned to serve as a comprehensive digital platform for the shipbuilding industry, it shall be integrated with relevant external data sources, to enhance functionality and provide real-time, authoritative information to users. These integrations will be carried out through APIs, subject to prior consent from the competent authority.

Upon receiving necessary approvals, dynamic data from official external websites will be pulled and displayed on the portal in real-time or near real-time, ensuring authenticity, relevance, and alignment with stakeholder needs. The integration will be designed to support scalability, data accuracy, and compliance with applicable data-sharing protocols.

Below mentioned table illustrates the tentative list of data to be dynamically pulled from official external websites**:**

Sr.	List of data	Name of Source
1.	Shipyards data, overall utilisation of fund	SBFAP/DGS/MOPSW/Competent authority
2.	Policy incentives and guidelines related to credit note scheme	SBFAP/DGS/MOPSW/Competent authority
3.	Location/overview of shipyard(s)/clusters for greenfield and brownfield project	SBFAP/DGS/MOPSW/Competent authority
4.	Status of the project in greenfield and brownfield project	SBFAP/DGS/MOPSW/Competent authority
5.	Policy details and operational guidelines for SBFAS	SBFAP/DGS/MOPSW/Competent authority
6.	New incentives in SBFAP	SBFAP/DGS/MOPSW/Competent authority
7.	Status of the projects related to ISTC	SBFAP/DGS/MOPSW/Competent authority
8.	Demand aggregation of the government agencies/PSUs-existing demand	SBFAP/DGS/MOPSW/Competent authority
9.	Identified stakeholders of Classification society	Official website of Classification society
10.	Identified stakeholders of Research and development	Identified R&D stakeholders' official website
11.	Shipyards	Identified data fields from the shipyard's official website
12.	Industry association and trade bodies	Identified fields from the official websites
13.	Shipboard Equipment, Material and Machinery suppliers	Identified fields from the official websites
14.	Shipbuilding and Ship repair Service Providers	Identified fields from the official website

Sr.	List of data	Name of Source
15.	Ship Design Agencies	Identified fields from the official website
16.	Skill Development Agencies	Identified fields from the official website
17.	Financial Institutions and Insurance Providers	Identified fields from the official website